MOTOR BOATING

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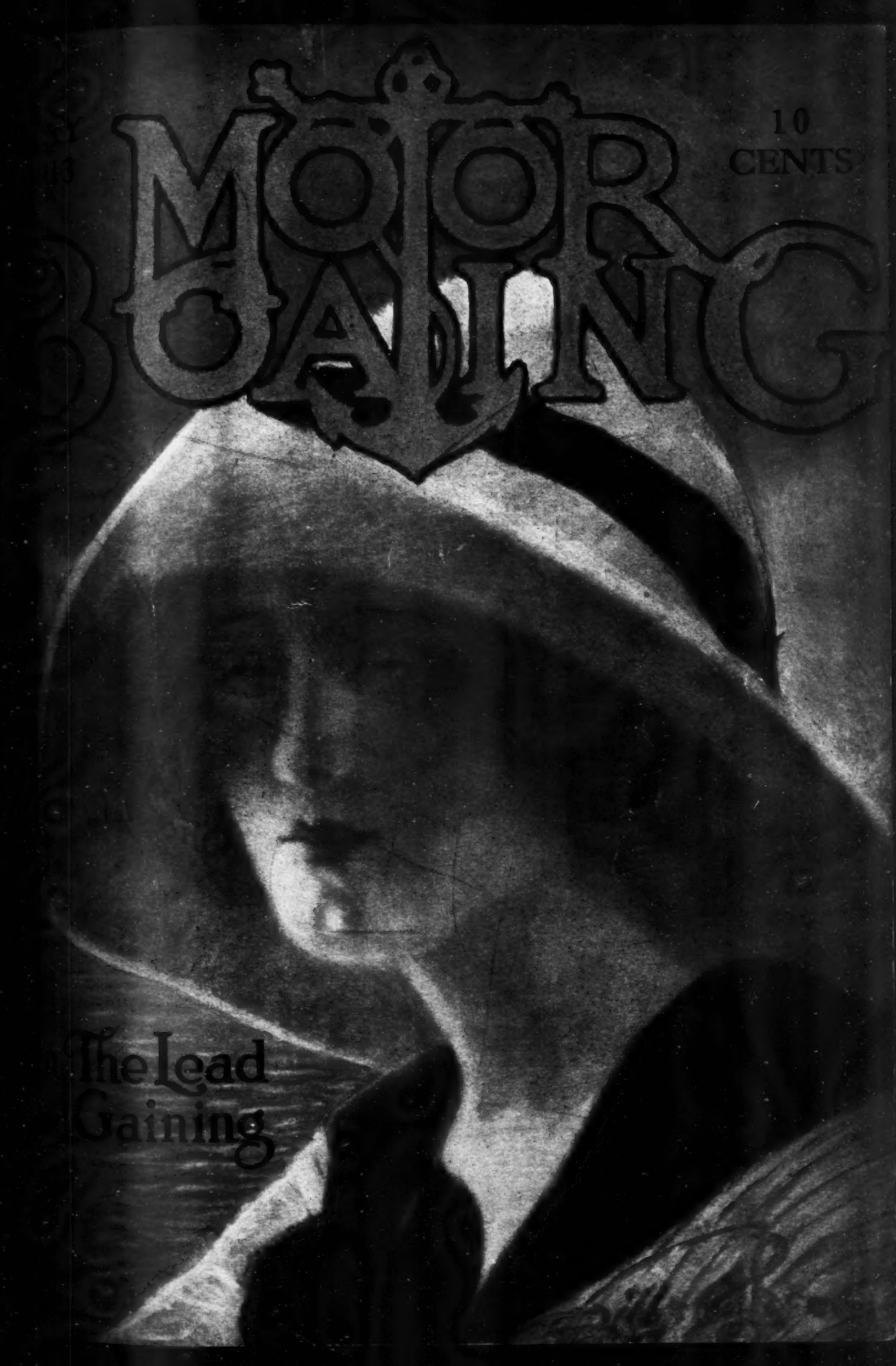

CONTENTS

Wolf's Head II, owned by F. A. Lynn, designed and built by Atkin Wheeler Co.

May 1913

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THE NATIONAL MAGAZINE OF MOTOR BOATING

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Photograph by Levick

After the "fitting out."

The first spin of the season.

THE NATIONAL MAGAZINE OF MOTOR BOATING

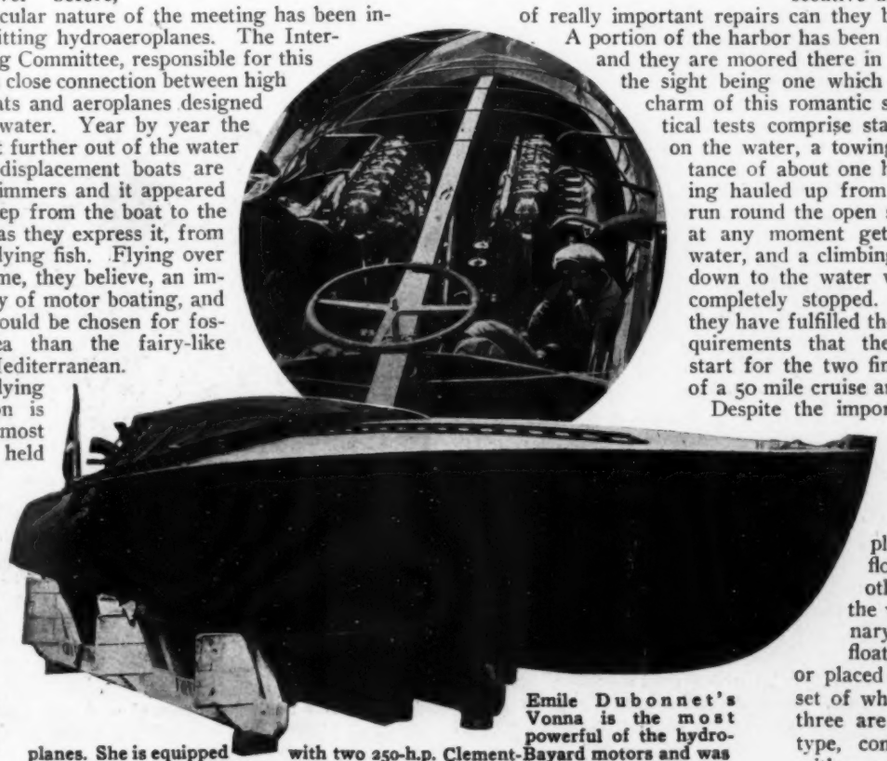
The Annual Meet at Monaco.

The Exhibition that Proceeds the Eleventh Annual Regatta and a Critical Discussion of the Most Promising Boats and their Motors.

By Robert Fletcher.

No event on the motor boating calendar compares in magnitude with the annual Monaco meet. Once a year the picked craft of Europe are gathered together at Monte Carlo on the Mediterranean for two weeks of exhibition and racing. Many radical designs have made their appearance at this annual event, either to survive the test of competition or to fail and take their place among the class of freaks. This year there is a striking tendency toward greater uniformity of design and of more marked division into classes than ever before. Read Mr. Fletcher's interesting description.—Editor.

FOR the eleventh year in succession Monaco is the scene of the greatest motor boat gathering known to Europe. This year's event is in no way inferior to its predecessors, for although the number of boats is not as high as usual, the quality appears to be better than ever before, while the spectacular nature of the meeting has been increased by admitting hydroaeroplanes. The International Sporting Committee, responsible for this gathering, sees a close connection between high speed motor boats and aeroplanes designed for work over water. Year by year the former have got further out of the water until even the displacement boats are more or less skimmers and it appeared but a natural step from the boat to the flying boat, or, as they express it, from the fish to the flying fish. Flying over water will become, they believe, an important auxiliary of motor boating, and no better spot could be chosen for fostering this idea than the fairy-like shores of the Mediterranean.



Emile Dubonnet's Vonna is the most powerful of the hydroplanes. She is equipped with two 250-h.p. Clement-Bayard motors and was designed by Alfonse Tellier as a challenger for the British International.

This year's flying boat competition is the biggest and most important ever held in Europe or elsewhere. It has united twenty-six competitors, all but two of which are French. America is not represented, although the Curtiss machines are well known over here. The explanation given is that no machine could be got ready in time. This is the first occasion on which flying boats have had to do really nautical work. The regulations stipulate that they shall be kept afloat throughout the whole of the meeting, or for sixteen consecutive days. Only in case of really important repairs can they be brought ashore. A portion of the harbor has been reserved for them and they are moored there in picturesque array, the sight being one which only adds to the charm of this romantic setting. The nautical tests comprise starting and settling on the water, a towing test over a distance of about one hundred yards, being hauled up from a ship's boom, a run round the open sea course without at any moment getting clear of the water, and a climbing test with a glide down to the water while the motor is completely stopped. It is only when they have fulfilled these preliminary requirements that the competitors can start for the two final tests consisting of a 50 mile cruise and a 300 mile race.

Despite the importance paid in the regulations to nautical ability, most of the machines are of the pure aeroplane type with floats attached. In other words they are the various firm's ordinary machines, with floats substituted for or placed in addition to the set of wheels. Only two or three are of the pure boat type, consisting of a hull with passenger room, a

Skisc, the Italian displacement boat and her 600-h.p., eight-cylinder Isotta Fraschini motor.

motor, and chain or shaft transmission to a propeller. This latter type has evident superiority for skimming over the surface of the water or for riding out in a rough sea; nevertheless, it is not at all certain that it will win out under the Monaco conditions, for while the rules favor nautical ability, the weather conditions here are such that a speedy flyer with poor nautical equipment may win over a poorer flyer with first-class seagoing qualities.

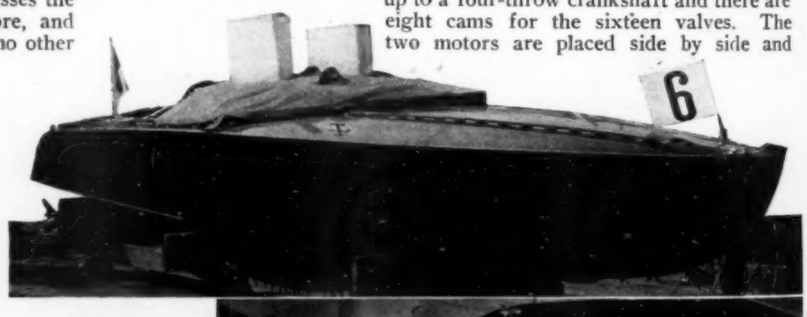
There are 78 boats gathered in the exhibition yard. This is a smaller number than on previous years, but is explained by the fact that the committee has this year fixed a speed limit, having had the result of eliminating all the local boats of no interest except to their owners. While the actual starters in the races will be fewer in number the competition will be keener, for in no single class is it possible to pick out a boat that is decidedly superior to its companions. The fleet of 78 is made up as follows: 6 hydroplanes, 16 racers, 18 21-footers, 3 first series cruisers, 8 second series, 8 third series, 10 fourth series, and 9 fifth series. In the cruiser classes the limitations are overall length, cylinder bore, and maximum weight. For the racers there is no other restriction than a maximum overall length of 49 feet. Hydroplanes are also left free, with the exception of the overall length restriction, but while a displacement boat can compete in the hydroplane class, if desired, a hydroplane cannot compete against a racer. The rules stipulate what is and what is not a hydroplane, and in addition the committee has the right to refuse to admit as a racer any boat which it considers to be a hydroplane.

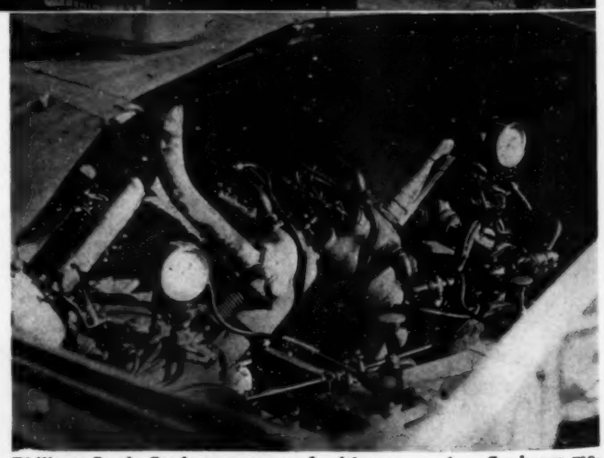
The uniformity in design this year is most striking. Even the clear distinction made between gliders and displacement boats does not prevent a distinct evolution toward a common type. There are scores of so-called displacement boats which only differ from the hydroplanes by reason of the absence of a step. The prevalent design is an evolution of what is known as the Miranda type. Locally it is known under the rather vague definition of the flatiron type. The average boat here has a fine, deep V-section bow, gradually changing into vertical sides, a hard bilge and absolutely flat bottom. There are numerous modifications of this, the fine V-sections developing in some cases into U-sections, but this does not prevent the general design being surprisingly uniform.

In the hydroplane class the most powerful boat is Emile Dubonnet's Vonna, built with the intention of competing in the Harmsworth trophy races next August. The hull is similar to the designs of Alphonse Tellier, and the motors have been supplied by the Clement-Bayard Company. Vonna is a development of the flatiron type of glider with double V-sections forward, slightly concave sides, a hard bilge, a shallow step, and a bottom of a very open V type. Owing to the shape of the bottom the step entirely disappears on the center line, its depth gradually increasing as it recedes from this line until the maximum is attained at the extreme width of the boat. The sides of the boat consist of three plankings, two being diagonal and one horizontal, and the bottom has four plankings. Vonna carries a couple of six-cylinder engines primarily designed for use on the new French airships. They are a type built to the order of the French government, and are being given their first practical tests afloat before being placed in the nacelle of the airships. The two motors are placed side by side and slightly aft, their drive going forward through a double universal jointed shaft to enclosed spur gearing, and the long propeller shaft running aft directly beneath each motor. The six cylinders are of steel with copper water jackets and have a bore and stroke of 6.1 by 7.8 inches. The valves are inclined in the head, their operation being by means of an overhead enclosed camshaft worked from a vertical shaft and a couple of pairs of bevel pinions at the rear of the motor. A cross shaft drives the magneto and water pump, and the oil pump is at the rear and external.

A peculiarity of this power plant is the spring mounting of each engine. Each motor is placed on a steel channel section frame having transverse laminated car type springs shackeled to hangers on the fore and aft members of the boat. The gearing is also spring mounted, the frame for this housing being entirely independent from that carrying the motor. Although the drive is indirect, there is no reduction, the screws turning at engine speed, which is declared to be 1500 to 1600 revolutions. Each motor develops 250 h.p., giving a total of 500 h.p. This is the greatest power to be found on any of the boats at Monaco. The spring mounting of engine and gearing is an airship idea, this system being adopted on all the Clement-Bayard dirigible balloons in order to diminish vibration. It has not previously been tried on motor boats, but it is believed that will protect the engine base from shocks and prevent the breakage of crankcase hangers, which was a trouble on some previous light-weight high-powered motors.

Tellier has a second boat in this class of very similar design to Vonna, but of shorter overall length and differing entirely in its power plant. It is Philippe Leo's Sunbeam, equipped with a couple of Sunbeam 8-cylinder motors, developing 120 h.p. each. The engines are a development of a recent racing car type, measuring 3.1 by 5.9 inches bore and stroke. Each set of four cylinders is a single casting, with integral water jackets and valves on one side, the two groups being mounted in V on an aluminum crankcase. The connecting rods are forked up up to a four-throw crankshaft and there are eight cams for the sixteen valves. The two motors are placed side by side and

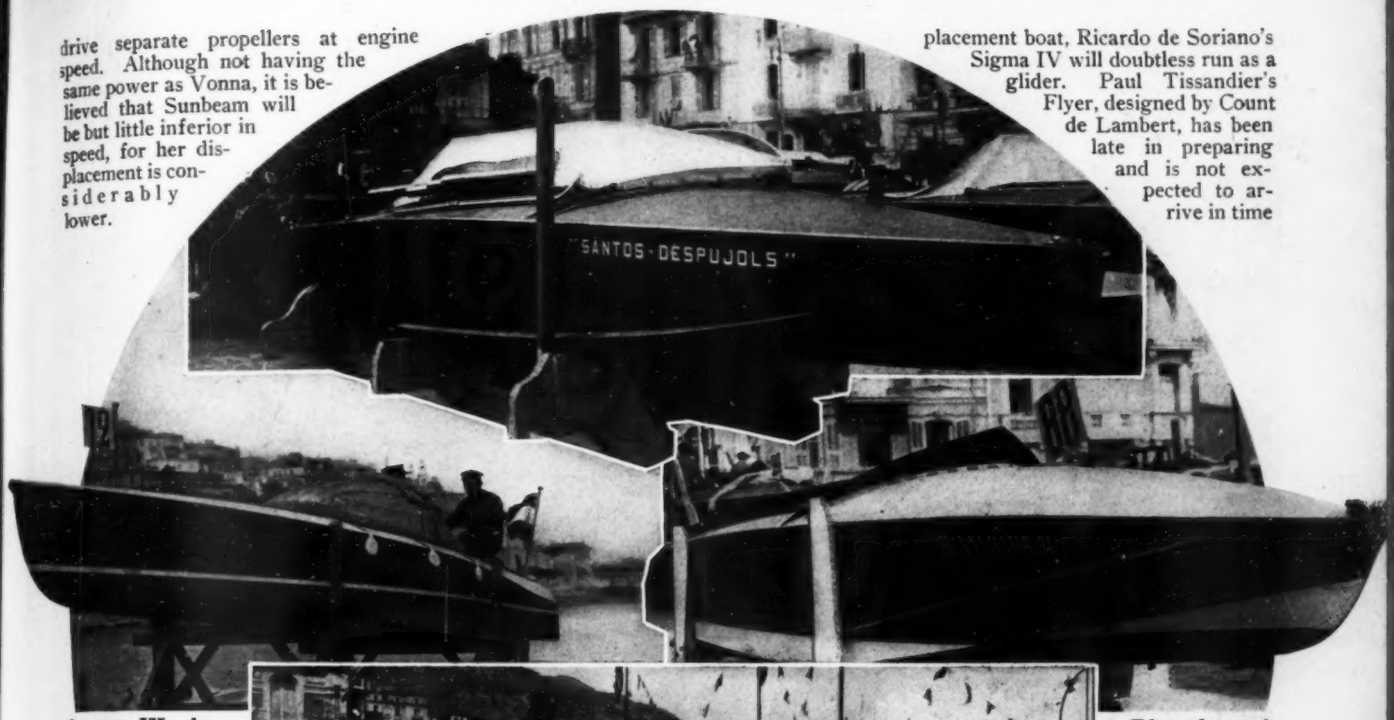




Philippe Leo's Sunbeam, powered with two 120-h.p. Sunbeam motors. She is similar in design to Vonna.

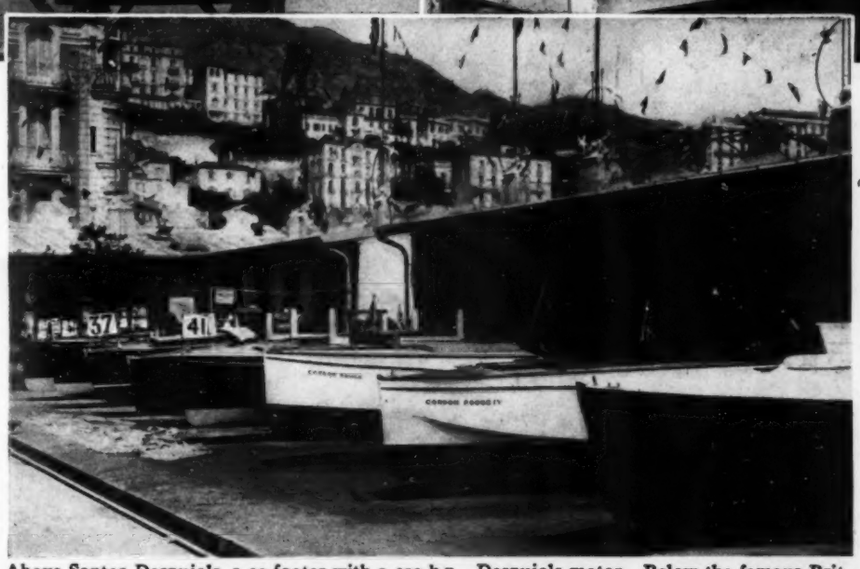
drive separate propellers at engine speed. Although not having the same power as Vonna, it is believed that Sunbeam will be but little inferior in speed, for her displacement is considerably lower.

placement boat, Ricardo de Soriano's Sigma IV will doubtless run as a glider. Paul Tissandier's Flyer, designed by Count de Lambert, has been late in preparing and is not expected to arrive in time



Annette III, the German monoplane, built by Lürssen and powered by Saurer.

The fourth series cruiser Minnehaha II is really a monoplane.

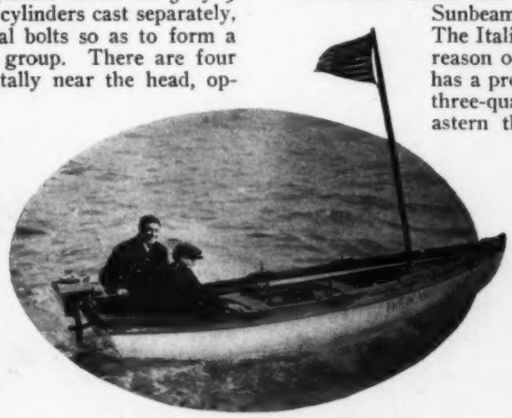


Above Santos Despujols, a 30-footer with a 300-h.p. Despujols motor. Below the famous British 21-footers that have become probably the most popular class of the meet. Fourteen are from England, three from France and one from Italy.

The two most formidable competitors of Vonna and Sunbeam are Santos-Despujols and Le Quatre, both built by Victor Despujols. Santos-Despujols carries a 6-cylinder Despujols of about 300 h.p.; Le Quatre has a big 4-cylinder Fiat motor. The hulls are very similar in design, although differing in length, Santos-Despujols measuring 30 feet and Le Quatre 26 feet. These boats are of the flat-bottom U-section type with a moderate step and a deep V-section displacement type bow, being a development of the Brasier-Despujols and Gregoire types of last year. Aboard Santos-Despujols is a Despujols 6-cylinder motor of 5 by 9 inches bore and stroke, having its six cylinders cast separately, but connected together by longitudinal bolts so as to form a common water jacket for the entire group. There are four valves per cylinder mounted horizontally near the head, operated by camshafts and push rods with bell cranks on each side, and maintained on their seats by laminated springs. The motor is set considerably out of the center line and the rudder post is also offset as far as possible. The Fiat engine aboard Georges Barriquand's Le Quatre is a huge monobloc of 7.4 by 9.8 inches bore and stroke, having valves mounted vertically in the head and entirely enclosed by an aluminum cover, this disposition adding to the height of the engine and considerably increasing its bulky appearance. Although a dis-

for the races. It is a very light hull fitted with an aeroplane motor driving an aerial propeller.

In the racer class the surprise of the meeting is the Italian boat Skisc. It was not known that the Italians were making any great effort this year, but the appearance of Skisc shows that they have got a boat quite capable of winning the Coup des Nations, the most important trophy offered for competition, particularly if weather conditions are somewhat rough. Given a calm sea, one of the hydroplanes ought to be able to secure this prize, but in broken water Skisc will be very hard to beat by Vonna, Sunbeam, Le Quatre, or Santos-Despujols. The Italian differs from her French rivals by reason of the absence of a flat bottom. She has a pronounced keel throughout more than three-quarters of her length, it being only full astern that her bottom becomes absolutely flat. Her bow is very fine, with a certain amount of flare; she has a clean run and a pronounced tumble home in her after sections. In general she recalls last year's Sciata with numerous pleasing improvements. Her power plant consists of an 8-cylinder Isotta-Fraschini motor of 5.9 by 9.8 inches bore and stroke. The cylinders are in Indian file and although consisting of two sets of four cast in pairs with screwed on



The Evinrude represents America.

(*Continued on page 62*)

Racing at Monaco.

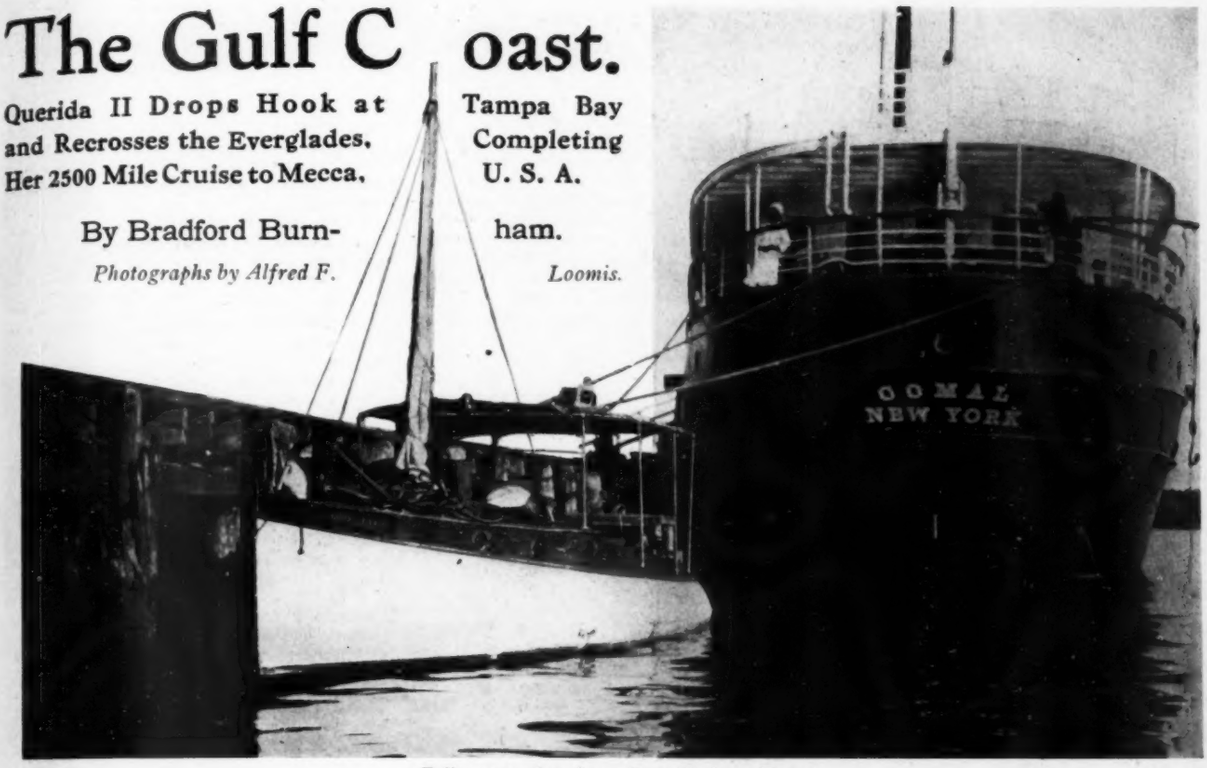
Two of the famous British 21-footers and the French racer J'en Veux contestants in the Monaco races. Note how the top boat heels inward on the turn. *The trophy is that offered by the Prince of Monaco for the mile and kilometer trials.*

The Gulf Coast.

Querida II Drops Hook at Tampa Bay and Recrosses the Everglades, Completing Her 2500 Mile Cruise to Mecca, U. S. A.

By Bradford Burnham.

Photographs by Alfred F. Loomis.



Fellow travelers from New York to Tampa.

This is the last chapter of Querida's cruise, which Mr. Burnham has written of so interestingly in the recent issues of MoToR BoatinG. Running up the west coast of Florida to Tampa and then retracing her course across the Everglades, she finally drops anchor at Miami for a well-deserved rest after 2500 miles of ocean, canals, lakes and rivers.—Editor.

WELL, our cruise to "Mecca" is history and the only thing left is to compile statistics—to figure the number of gallons the old girl drank; how many billion times the propeller revolved; whether the number of oranges consumed equaled the number of casualities reported in the Great Okeechobee Mosquito Massacre and, finally, the all-important question of on which side of the ledger the balance stands. But as neither the skipper nor the chief are mathematically inclined, suppose we forget the whole business, and think only of the vivid high lights composed of the major episodes of the cruise and shaded by the thousands of minor incidents which contribute equally in forming the memory picture to which time alone can supply the correct perspective. But even now before the tan begins to fade from our shoulders, we are loud in our affirmation that we wouldn't have missed it for a universe, in spite of its Arctic beginnings, its shallow water trials and tribulations, its culinary disasters, and its mosquito capitulations. In fact, it may even be in part on account of these very things, as well as its glorious excitement in big seas and brisk winds, its inspiring sunrises and sunsets, its wealth of rare natural beauty, its fine hunting and fishing, its glorious plunges over the side, and its delicious flap-jack parties that we make this assertion. And after five months of compressed housekeeping aboard Querida II, life in a New York apartment will be quite bearable.

Instead of continuing to the mouth of the Father of Waters, we let Tampa have the distinction of being our most distant port, and then retraced our way to Miami.

It's almost exactly one hundred and fifty miles from Fort Myers to Tampa by the route taken by Querida II, forty-five of which lies outside. Chugging down the Caloosahatchee —which we have just learned is Seminole for Beautiful River instead of Crooked River, and that it ends in *ee* and not *ie*, below Fort Myers we tried to accustom ourselves to changed conditions. Now we found a northeast wind the most favorable for fair weather and smooth seas; now, the mid-day sun was to be behind us as we steered northward; now, motor boats were less commonly passed, and small ones from the east coast and northern ports were very, very rare.

The River from Myers down is broad and well buoyed or rather "beaconed" and at Punta Rassa, eighteen miles below Myers it enters San Carlos Bay. Here are first order range lights and second class nuns and cans, a noteworthy rarity in southern waters. With the southern end of Pine Island on our starboard beam, we ran down the Bay toward Point Ybel light, the most southerly lighthouse on the Florida west coast, except the Keys, till we came to nun number 8. We then rounded up toward St. James "City" on Pine Island passing it close to. We wiggled through some shallow water with the help of the chart and ran Pine Island Sound all right, leaving beautiful Useppa Island, a tarpon headquarters, on the port hand. Soon thereafter we came to Boca Grande (Big Mouth), at the entrance to Charlotte Harbor, of which Punta Gorda is the principal port. Here we lay over night and prepared for outside work.

Calm seas and a helpful southeast breeze greeted us next day as Querida chugged out the Inlet turning northward through the seven foot slue which runs close to the point at the north side of the inlet. The run up the beach to Sarasota Inlet was made without special incident. The beach runs almost straight in a NNW and SSE direction with few points and bays and with two or three possible inlets of which Casey's Pass is the best.

It is a cinch to enter Sarasota Bay, for although the inlet is unbuoyed the pass is wide and the water clear. We kept close to the south shore till beyond the inside point, then rounded up into broad Sarasota Bay, avoiding numerous sand bars with the chart's assistance. At the northern end of the bay we shoved the anchor off the edge of the deck for the night. We were off the fishing village of Cortez; but we were a good ways off, and we would like some good gentlemen of Cortez to show us how he gets in to his home shore. We couldn't.

Tampa Bay seemed quite like home, for it seemed more like northern waters than anything we had seen south of the Chesapeake; except that sand instead of rock predominates, it reminded the skipper strongly of Buzzards Bay. It is broad and long and deep, well buoyed and lighted, and a splendid cruising ground for able small boats. True, it can get most tremendously agitated, but so can any place where cruising is really worth while. It is normal, and Querida knew how to deal with it, which is not the case with Lake Okeechobee.

We ran up its whole length to Tampa, the metropolis of the west coast, where the Negro is largely replaced by the Cuban, and where cigars are common as tooth picks. Here again we were impressed with the scarcity of pleasure motor craft as compared with the east coast. It would seem that the west coast is a cruising ground little frequented and little known about by northern owners of small boats. And it certainly is without a peer in the South, provided one has a good able boat and enjoys the spice that comes with crested waves and occasional blows. We, at any rate, want to see it again, which is more than we would say of the east coast waterways until they are cleaned out, were it not for what lies beyond them.

At Tampa we were received and heralded by the press much as we imagine anyone who had paddled a canoe from the South Pole would be greeted, and after stoutly declaring that we had come for the sport of it and not on a wager, we visited one of the big cigar factories and came away with pockets crammed with three for fifties.

A pleasant run of two hours and a half, brought us to St. Petersburg, a rising and pretty resort on the north side of the Bay, some 23 miles below Tampa. It was mid-afternoon and we found the populace in swimming and soon joined them in the surf of this Floridian Atlantic City. The water on the west coast is much cooler than it is on the east coast in the same latitude, and we found a trace of the old exhilarating shock which

Two of the famous British ax-footers and the French racer J'en Veux contestants in the Monaco races. Note how the top boat heels inward on the turn. The trophy is that offered by the Prince of Monaco for the mile and kilometer trials.

a dash in the Maine surf brings.

Across the broad bay and somewhat to the southward is the outlet of the Manatee River, and for this invisible point we set our course next morning. It was much like crossing the Sound from Bridgeport to Port Jefferson on a mild mid-summer day, and before we had lost the shore line behind us the opposite side was plainly discernible. We went up the Manatee to Bradentown, and after lunch and a squint at the surrounding country which one cannot view in any direction without seeing the gold of the orange, we got underway for Sarasota. It was after dark when we made it, which may, or may not, account for our pausing on a sandbar at the entrance for quite an appreciable period.

The next day we had stellar attractions. It commenced with a perfect dawn, followed by a perfect sunrise into a clear sky and upon calm seas. We were up early enough to bring back to mind the 1:30 A.M. start we had made by mistake at Southport, away back in the middle ages, and by seven o'clock were again outside upon the Gulf of Mexico. The absence of land to the westward seems strange at first to one accustomed the Atlantic seaboard, but we were most particularly glad to have it there that morning. We had not been outside on hour before the light southeast wind decided to increase its activities, and before noon its energy was rewarded by developing into a good husky blow. Still, by hugging closely the shore to eastward we had comparatively smooth going of it. By way of divertisement the skipper threw over a line with a kingfish spoon and white rag attached, and without slowing down to troll, soon hooked a fat three-footer, letting the unsteered boat describe a generous circle while he pulled in the line.

The Gulf of Mexico is not usually thought of as a harbor of refuge, we feel quite sure, and when we found a tiny fishing boat serenely anchored out in the Gulf at the entrance to Boca Grande, with the occupants not fishing or otherwise employed, we were decidedly puzzled. We were soon to be enlightened. The tide was flooding strong, a squall had but just passed, and that healthy east wind had a clear stretch of twenty miles across Charlotte Harbor to fool with. Consequently, when we left the calm waters of the Gulf to enter Boca Grande, we ran into some real live music. Querida was thoroughly surprised at first, and dipped her nose good and deep into the green body of a breaking comber. She came up, snorting, and shaking herself free, got down to business. With careful spinning of the wheel, and unfaltering service on the part of the Fay and Bowen, she wriggled through and over, and under, the rough seas with the ease of a porpoise. Her action was beautiful, and although she jumped clear of the water as far aft as amidships, and skidded and side stepped, and bucked and high kicked, she never dived, and no solid water came into the cockpit. But it was our liveliest few moments on the entire cruise and we worked her over to a nearby pier we hadn't intended to go to with all dispatch, tying up with heavy hawser in the lea of a giant, sea-going dredge.

It was squally all the rest of the day, in spite of that perfect dawn and sunrise, but after a while the tide turned and the sea became gentler. We tightened our oilers and ran across to beautiful Useppe Island, for the night, taking Easter dinner at the famous Tarpon Inn. We also scraped the dried salt from our blistered faces, and for once condescended to sponge the stinging epidermis with soothing witch hazel. We are still some decades away from being old salts.

By noon of the second day out from Tampa Bay we were again at Fort Myers, moored close to the beautiful cruiser Nemes, formerly the Ilys of ocean racing fame. Here we stocked up for the return across the Everglades, and toward sunset ran up the Caloosahatchee a few miles, anchoring for the night among the "Beautiful Islands" on the edge of the chart.

The Caloosahatchee is an exceedingly interesting river to the northerner. Its scenery is the most tropical found on any navigable river in the United States. One is inclined to hurry from under some low overhanging limb, lest a boa constrictor drop aboard, and the trees seem as though they should be filled with monkeys. And yet the inclination is to linger, too, amid the fascination of the dense foliage and thick undergrowth, which gives the river a perpetual shadow. Here and there the moss-laden live oaks and the impenetrable mangroves are broken for a narrow space by a clearing, and in the vista opened up the green trees of some large orange plantation are glimpsed, with the picturesque packing house, in the foreground, its sides and roof thatched with dried palm leaves.

Whether a fellow wants to linger or not he is obliged to before he gets far up the stream, for the Caloosahatchee does its best to make him go the other way. Yet our persistency was finally rewarded, and at noon next day we made LaBelle, 44 miles above Ft. Myers by the river. A crow would find it perhaps thirty. Learning that the chief avocation of LaBelle citizens is duelling with buckshot loaded shotguns at fifteen feet, we got underway again with much celerity, and made for the wilderness ahead.

A thorough system of screening failed to exclude the ravenous mosquitoes.

Above LaBelle we noticed the rapid and complete change in the character of the country. Trees became few, and the undergrowth vanished, giving way to a stretch of fairly dry pasture land. At this juncture the skipper was below—a rare occurrence—when the chief suddenly thrust his face into the companionway, and yelled:

"Come up quick and see some Caloosahatchee reindeer." Instantly the dignified skipper sprang from the companionway with excitement on countenance and 30.30 in hand.

"Where away?" he whispered tensely, scanning the horizon with eagle eye.

"There; see!" replied the chief, pointing, with face carefully averted.

Looking in the indicated direction the excited skipper beheld—as peaceful a herd of sleek cattle as ever grazed on Kansas pasture. Adroitly the chief dodged the kerosene oil can, and the skipper retired to the cabin to fulminate for an hour or more until the weeds of Lake Hicpochee claimed his attention.

We crossed this smaller lake, found the entrance to Three-Mile Canal, bucked its racing current, and at 4.24 P. M. anchored for the night beneath the beacon cypress on the shores of Okeechobee. Hardly had the engine ceased when the afternoon tea of the mosquitoes began. After dark it was followed by a reception the like of which we hope never to have a part in again. They made a noise like an immense swarm of bees, and were about the same size. Lake Okeechobee mosquitoes are especially musical and especially large, while their vitality is amazing. On account of their size and musical gifts the natives are wont to catch them, paint them yellow, and sell them as canary birds, which would be a good story, but for the fact that there are no natives.

There was little sleep aboard Querida II that night. Somehow or other dawn finally came according to schedule; but before it was really light we arose in wrath, and not stopping for the formalities of dressing or breakfasting, got the old faithful going, after clearing away enough skeeters from the cockpit to give the carbureter air.

The time has come to correct another mis-statement in the last number and to apologize for it. The correct course for the outside route across Lake Okeechobee is NE from the lake end of the Fort Lauderdale canal, till off Observation Island, some 25 miles distant. This course leads straight out of South Bay, leaving Rita Island about one-half mile to port and keeps well clear of the reef inshore mentioned in the last article. Rita Island is the only island of any size left to port on this course till Observation is reached. It has a house near the northern end. The NE course will bring you about a mile and a half off Observation Island, which is also left to port. The island lies well out in the lake and is about ten miles from the Three Miles Canal. After well past it, bring it to bear on your port stern quarter and heading about W or W ½ N, run till about two miles from the western shore. Then steer SSW and in a short time you will pick up the cypress at the canal entrance. There are other trees along the lake shore but none so high and no other cypresses.

We followed the foregoing courses reversed

(Continued on page 64)

A Medium Sized Motor Yacht.

A 65-Foot "Twentieth Century" Cruiser for Mrs. Alice D. Wetherill of Philadelphia.

CHIPPER II is a 65-foot motor yacht just completed at the yards of the New York Yacht, Launch & Engine Company, of Morris Heights, New York City, for Mrs. Alice D. Wetherill, of Philadelphia. While not radically different from a number of boats of her class turned out by the same concern, she is nevertheless an interesting boat and well worthy of special notice.

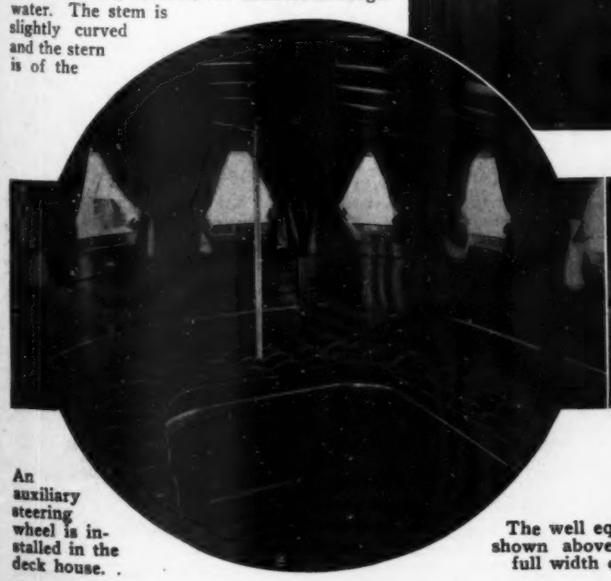
The new boat represents about the most practical length for a cruiser of medium size for it is possible to employ the deck house, sinking it sufficiently to overcome excess top hamper and still leaving enough headroom beneath it so that the motor may be installed at this point. In a much smaller boat this would not be practical.

In type the boat is raised deck, this deck being continuous with the roof of the cabin trunk, which by the way, extends almost to the sides of the boat, eliminating the usual runways and giving more room, both above and below. The bridge is just abaft the deck house which protects it and it is raised a bit above the deck by a small trunk over the galley. There is a flush deck aft. The hull is well designed for cruising work, having sufficient draft and deadrise for comfort in rough water. The stem is slightly curved and the stern is of the so-called whale boat type, the keel extending in a gently sloping unbroken line from fore foot to skeg, a point that should make for easy steering in bad weather.

Below decks the forecastle with toilet and laboratory accommodations for the crew, is of course forward, followed by the engine room in which is installed the 65 h.p. six-cylinder 6½" x 8"½ Twentieth Century motor. To port of the main engine is installed a direct connected generating set with switch board and the engine room is also equipped with work bench, lockers, transom, etc.

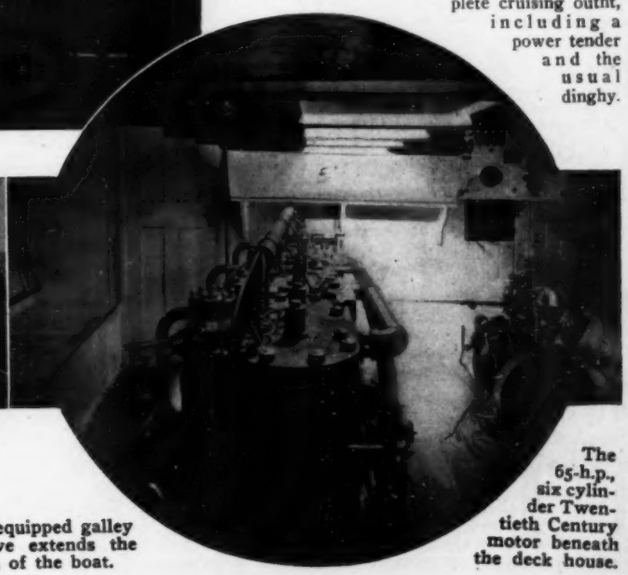
The galley is situated between the engine room and the living quarters and extends the full width of the boat. The living quarters are divided into a main saloon amidships with buffet and extension transoms along either side. It is entered directly from the companionway on the cabin roof. The passage leads aft to the owner's stateroom and on either side of the passage are a smaller stateroom with fully equipped bath room. The principal dimensions are 65 feet overall, 13 feet beam and 3 ft. 6 in. draft.

Chipper II will be used in the vicinity of Philadelphia and Newport during the coming season. She will be fully equipped with complete cruising outfit, including a power tender and the usual dinghy.



An auxiliary steering wheel is installed in the deck house.

The well equipped galley shown above extends the full width of the boat.



The 65-h.p., six cylinder Twentieth Century motor beneath the deck house.

Reversing Propellers.

A Means of Obtaining Reverse Motion of the Boat, a Variable Pitch, Reliable Control and Any Speed from Full Ahead to Zero or Full Speed Astern.

By Chas. F. Chapman.

LAST month we considered one class of reversing devices for motor boats—the clutch and reverse gear, describing in detail the most characteristic makes on the market. This month we take up an entirely different principle for effecting the reverse motion of the boat, namely the reversing propeller. With the clutch and reverse gear we saw that the direction of rotation of the propeller was changed when it was desired to drive the boat astern. With the reversing wheel, however, the direction of rotation is always kept the same but the angle or pitch of the blades themselves is changed. For the forward motion of the boat the after sides of the blades is the working surface, but by changing the angle of the blades relative to the plane of rotation it will be seen that the forward surface will become the working one and reverse motion of the boat will result.

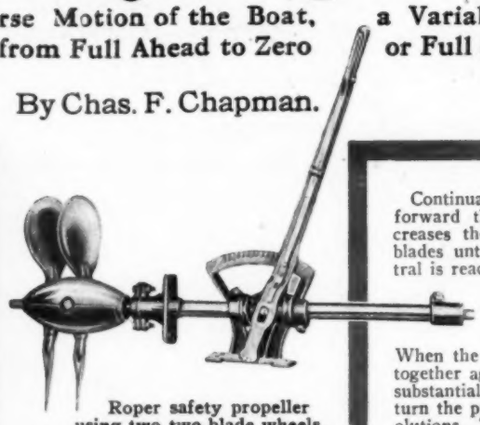
In order to change the angle of the blades they are made to work in a hub and turn about an axis at right angles to the propeller shaft.

A well designed reversing propeller outfit has the advantage of being light in weight and simple. As the pitch is variable, oftentimes it is possible to get the exact pitch that each particular boat and engine demands for the highest efficiency, as good speed at least is possible as with other types of wheels and the control is very flexible. Any speed, from full speed ahead to zero and full speed astern is possible by the manipulation of a lever.

Roper.

The Roper Safety Propeller, manufactured by C. F. Roper & Company, of Hopedale, Mass., is considerably different in principle from the ordinary type of reversing wheel and has several points of advantage in its design. The propeller proper consists of an H-shaped spider, a two-piece hub and four blades. The blades are designed on the lines of a perfect screw and are provided with arms having lugs which work in cam slots in the hub. The hub has a limited motion parallel with the shaft and this motion is changed into the circular motion of the blade by the action of the same slots on the blade arms, giving any desired pitch to the blades from zero to maximum.

The principle of the Roper Safety Propeller is that when the controlling lever is full forward or full reverse, the pitch of both pair of blades is the same. As the lever is moved from full forward the forward pair of blades turn on their bearings towards neutral, the back pair remaining at full forward and keeping the load on the engine. When the front pair have reached a predetermined angle, the back pair begin to turn toward neutral and the front pair begin to oppose the forward thrust of the back pair and the boat speed is slightly reduced.



Roper safety propeller using two two-blade wheels.

Leighton wheel for work and racing boats.

Wilmarth & Morman Company Sintz reversing propeller wheel.

Monarch reversing propeller with duplicate blades.

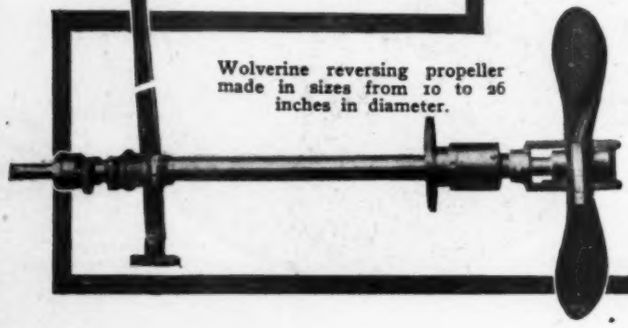
Continual motion of the lever reduces the forward thrust of the back blades and increases the backward thrust of the forward blades until they balance when the real neutral is reached. The boat is then at rest with full load on the engine. Further, the backward thrust overbalances the forward and the boat begins to travel in a backward direction. When the lever is full aft, all the blades act together again. At any position of the blades substantially the same power is required to turn the propeller at the same number of revolutions. The Roper Propeller is made of the best materials by first class workmen and is strong, durable and carefully designed for the work it has to do.

Sintz.

The Wilmarth & Morman Company, of Grand Rapids, Mich., having over 20 years' experience in the manufacture of the various types of reversing propeller wheels, is thoroughly acquainted with the defects which have existed in these devices in the past and have placed on the market this year a reversing propeller which will eliminate all of these faults. Their reversing propeller has but three working parts, namely the hub, shell and blades and the hub is guaranteed against breakage through the blades, striking any obstruction. The blades are fitted independently of each other so that in case one blade is broken, it is a very simple matter to replace that one without need of purchasing a complete new wheel or even a full set of blades. The wheel is practically weedless, as there are no projections to catch weeds.

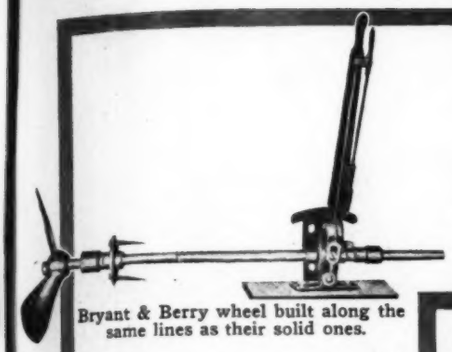
The Wilmarth & Morman reversing wheels are especially adopted to speed boats because of the fact that they take up very little room and add very little weight to the boat. The maximum pitch of the wheel can be adjusted so as to obtain a correct ratio of diameter and pitch for each particular boat. The heavy duty outfits are especially adapted to working boats because of the fact that the pitch can be so adjusted as to give maximum speed when the boat is running light and maximum pulling power when towing. These wheels are made from the small 8-inch two blade outfit for a motor canoe up to a 6-foot three blade outfit suitable for heavy duty work boats.

Some of the points of merit claimed by the manufacturers of these wheels are that there are no obstructions to catch weeds or drift, the entrance being pear shaped, insure solid water to the blades, the conical cape on the shell eliminates all suction, the drive from the shaft is distributed over the entire diameter of the hub and the blades cannot bind or stick in a hub and interfere with reversing. All thrust on the collars, outer sleeve and reverse lever is eliminated whether in forward or backward lead, and a uniform pitch to the blades can be continuously maintained. The



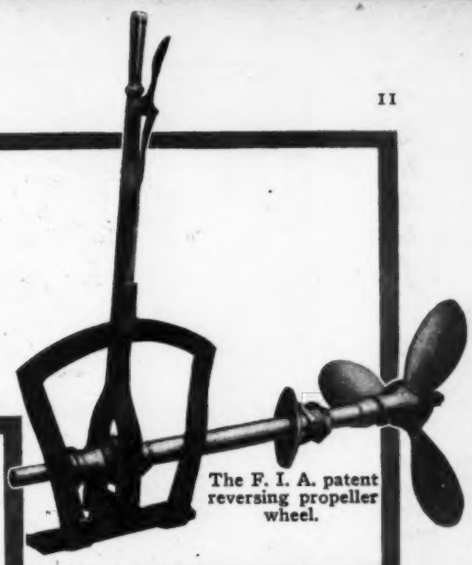
Wolverine reversing propeller made in sizes from 10 to 26 inches in diameter.

Famous Michigan reversible wheels built with two and three blades.



Bryant & Berry wheel built along the same lines as their solid ones.

Michigan two blade reversible wheel having only two parts besides the blades.



The F. I. A. patent reversing propeller wheel.

wheel is balanced and every part of the hub and mechanism is stronger than the propeller shaft. The blades are the only part of the wheel which can be injured from striking an obstruction and these blades cost little to replace. The quadrant is supplied with numerous notches so that the wheel can be held at any desired pitch when in operation.

Monarch.

The Grand Rapids Gas Engine & Yacht Company, builders of the celebrated Monarch marine engines, are manufacturing also a reversible propeller which they are prepared to furnish with any of their motor outfits or for use with other motors upon order. The Monarch reversing blade propeller has an efficient screw lead easily shifted to any desired pitch. The blades are duplicates and are quickly removed and replaced if injured, through striking any obstruction. There is no thrust friction on the lever shifting collar on forward pitch, thus transmitting the full engine efficiency to the propeller without lever friction loss. On full forward pitch the lever shifting collar rests against an adjustable collar clamped to the propeller shaft. The Monarch reversing propellers are made in 17 sizes, from 14 inches in diameter to 24 inches, with various diameters of shaft varying from three-quarters of an inch to 1 7-16th inch and outside sleeves of 1 1-16th inch to 1¾ inches. All outfits are of the two blade type and are fitted with either steel or tobin bronze shafts suitable for fresh or salt water installations.

Bryant and Berry.

Bryant & Berry Company, of Detroit, Mich., who have been so successful with their solid propeller wheels and owing to such numerous requests for a speed propeller of the reversible type, have decided to furnish it and are now manufacturing B & B reversible wheels in the two and three blade types, right and left hand. The material used is the same as that employed in the solid wheels and are constructed in the hub in a most ingenious manner so as to be practically weedless. These outfits are made in the lightest possible manner to insure strength and safety, all parts are highly polished; the hub is smooth, no bolts or projecting parts, all joints are closely fitted and thus prevent sand from getting inside. The wheels are perfectly balanced and many cases are on record where the speed of a boat has been materially increasd by the use of the Bryant and Berry wheel.

Michigan.

The Michigan Wheel Company, of Grand Rapids, Mich., are manufacturing two and three blade reversible propeller wheels with detachable blades, designed and built on the same lines as their solid speed propeller wheels and having the same form and appearance in forward pitch. The blades are set in the center of the hub on the center-line of the shaft, perfectly balanced and easy to operate. The pitch lines radiate from the center of the hub to the periphery. The blades have a bearing over the full diameter of the hub, which is larger than the area of the shaft. The brass sleeves rotates with the shaft and is moved longitudinally by the reverse lever. This sleeve operates the blades and yoke. The water is kept from entering the boat by an outside combination stern bearing and stuffing box and also by an inside stuffing box. Weeds, sand, etc., will not interfere with the reversing of this wheel and it is impossible to injure the hub or yoke so that either will refuse to reverse by striking any obstruction. The reverse lever and latch are made of heavy malleable iron, the quadrant and fulcrum of cast iron and the stern bearing, outer and inner stuffing boxes, thrust and clamp collars are of bronze. The outer tubing or sleeve is of brass with stern bearing babbeted. The two bladed Michigan improved reversible propeller wheel with detachable blades is made in 15 different sizes, both right and left hand. Diameters are from 10 inches to 28 inches and full pitch forward from 14 to 39.2 inches. The diameter of the shaft varies from 5-8 to 1 1-2 inches. The average horsepower required at 400 r.p.m. is 3-4 to 24. The three bladed Michigan reversible propeller is made in 10 sizes, 12 to 28 inches in diameter, 16.8 to 39.2 inches pitch. Diameter of shafts required is from ¾ to 1¼ and these are suitable for powers from 3 to 40 h.p.

The F. I. A.

The F. I. A. Reversing Wheel Company, of Syracuse, N. Y., are manufacturing the F. I. A. patent reversing propeller wheel and universal adjustable wheels, in addition to their line of solid speed and working wheels. The F. I. A. reversing propeller gives the operator absolute control of the boat to run either ahead or astern at varying speeds without attention to the motor, to hold the boat at a standstill, or to make landings with ease and safety. This is all done by one movement of the lever. In its operation the lever moves the outer brass tube or sleeve and the thrust terminates in a triangular or wedge shape piece of phosphor bronze. This wedge shaped piece is so constructed to receive the ends of the propeller blades. The principle is one of torsion without wear or stress on the working parts. By moving the lever the blades are turned and at the same time they are tipped ahead or astern. They can be made to take any pitch or position instantly. There is no lost motion, friction or slipping and the wheel can be set to suit the power of the engine and speed desired, ahead or astern.

The F. I. A. propeller is extremely simple. There are no complicated parts to cause trouble or get out of order. The blades are the same shape in forward pitch as the solid wheel and are equally efficient. Their pitch changes with each position ahead or astern so that the greatest possible efficiency is always obtained, and all parts are interchangeable. The reverse lever is made of steel, the quadrant of cast iron and the stuffing boxes, thrust and clamp collars are of bronze, the outer sleeve or tube and hub are of brass.

The blades are of the most approved height, made of best quality bronze and nicely finished. Should they become bent, they are easily taken from the hub and can be straightened cold. F. I. A. propellers can be installed in any boat where reverse equipment can be used. The control levers are so designed that they can be placed in any part of the boat most convenient to the operator. The outfit is light, clean, takes up a small amount of room, makes little noise, throws no grease and is not expensive. It will stop the boat in a very short space of time and allow one to maneuver into difficult channels and make landings quickly.

In addition to the reversible propeller the F. I. A. Reversible Wheel Company are manufacturing a patent adjustable propeller in which the blades may be adjusted to any desired pitch by loosing the lock nuts on the end of the shaft and turning the sleeve which turns the blades, but keeps the pitch uniform. The propeller can be set at any pitch that is most suited to the power of the engine and the size of the boat. In case a blade is broken it is easily replaced without delay and without the expense of buying a complete new wheel.

Leighton.

H. J. Leighton, of Syracuse, N. Y., builder of marine gasoline motors, is manufacturing reversible propeller wheels of both the solid shaft and the hollow shaft styles. The Leighton wheels are efficient, absolutely reliable and easily operated on both working and racing boats. For a given horsepower their weight is very light and there is no noise or objectionable features. Perfect control of the boat is obtained and a slight variation in the pitch of the blades, controlled by the reverse lever, the motor can be made to operate at its most efficient speed. The blades are accurately machined with reference to pitch and interchangeability and are so carefully fitted to the hubs that the latter will retain for an entire season the lubricant with which they are filled. In order to change blades in the hub it is only necessary to remove three heavy bronze screws. The working side of the reversing collar is fitted with a ball bearing and the reverse lever and quadrant are polished bronze.

A Leighton reversing wheel has recently been fitted to one of the steel ferryboats operating on the St. Lawrence River, between Ogdensburg, N. Y., and Prescott, Ont. Two wheels, 40 inches in diameter, 50 inches pitch with a shaft of 3½ inches are used, one at each end of the boat, fitted with hydraulic mechanism for reversing and adjusting pitch. These wheels get particularly hard service in ice during the winter and they have operated the boat through 8 inches of solid ice. One man controls both motor and wheels.

An assortment of blades of various diameter and pitches are carried in stock and special blades are made to order to meet any special requirement.

Among the many boats equipped with these wheels are three winners of the American Power Boat Association Gold Challenge Cup, raced for annually on the Thousand Islands' course. Chip III, which has a record of 30 miles in 58 minutes 19 seconds, was also equipped with a Leighton wheel.

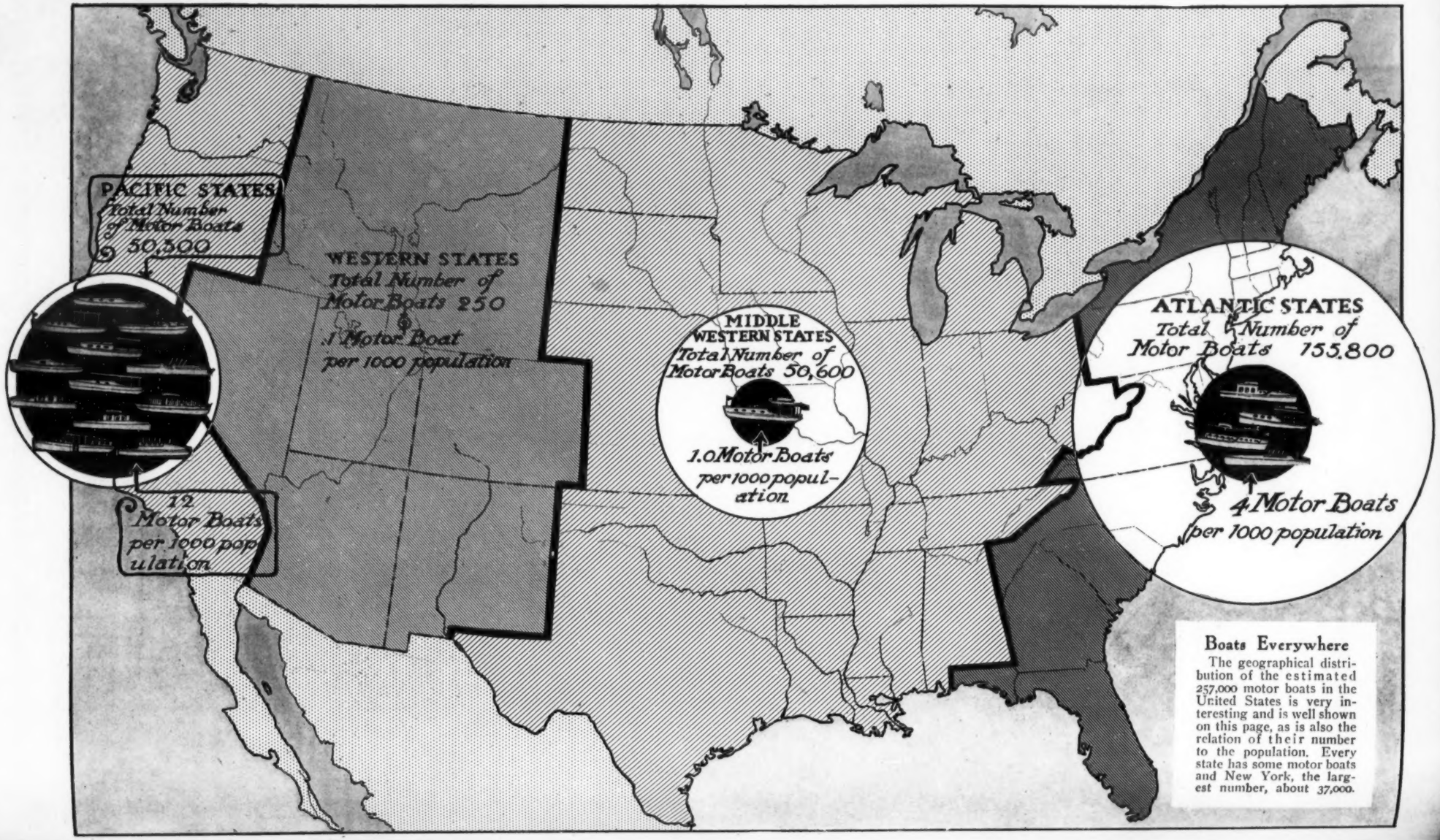
Wolverine.

The Wolverine Motor Works, of Bridgeport, Conn., are manufacturing the Wolverine reversing propeller wheel in sizes from 10 to 26 inches in diameter, all of the two-blade type. This wheel is made of the best quality bronze throughout and is accurately fitted together. The fork and hub are finished to gauge, and all parts are interchangeable, the blades being independent of each other and the loss of one by striking an obstruction does not necessitate the renewal of both. The blades have the same shape in forward pitch as the solid wheel and are very efficient.

With this wheel the operator has perfect control over his boat which can be run at any speed up to maximum and can be stopped within its own length when running at full speed ahead. There is no lost motion in this wheel, nothing to get out of order and no possibility of hub fouling with weeds or sand or of injuring the hub by striking any obstruction so that it will refuse to operate. When used on auxiliary boats, the blades can be placed in a perpendicular position behind the stern post, thereby reducing the friction on the water to a minimum when under sail. The wheel, stern bearing, stuffing box, outer shaft tube and collars are of bronze and the stern bearing is babbeted inside.

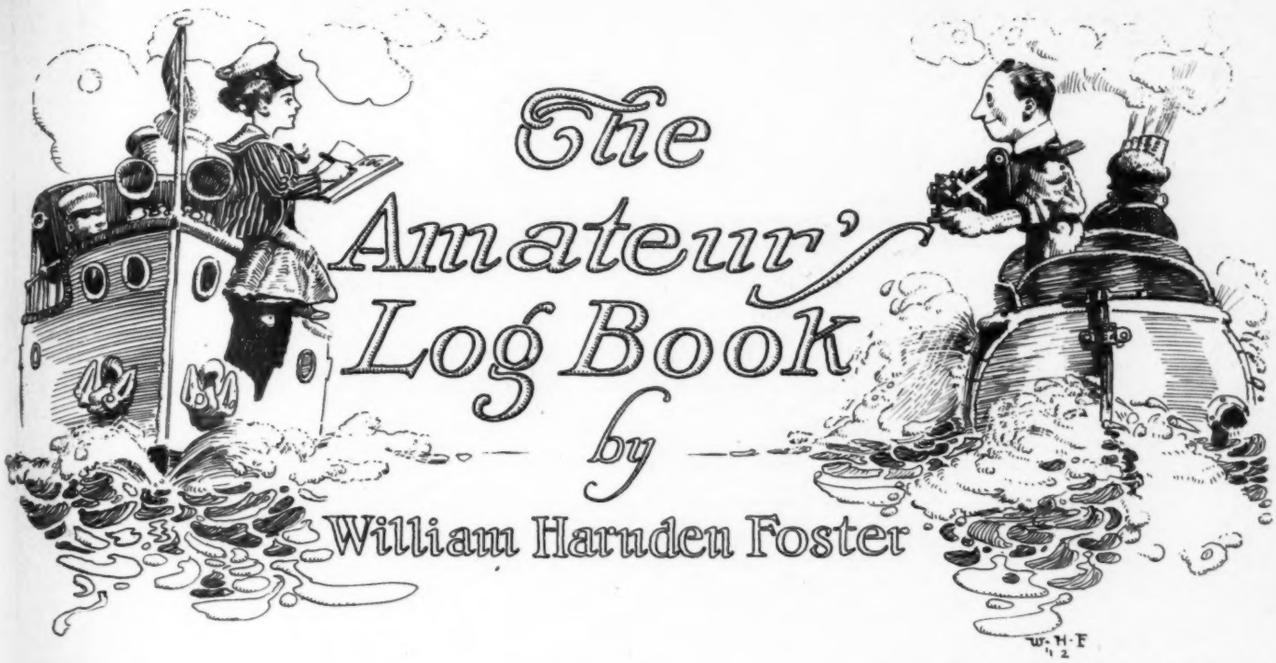
Distribution of Motor Boats in the United States.

Which Lead—The Atlantic or the Pacific States?



Boats Everywhere

The geographical distribution of the estimated 257,000 motor boats in the United States is very interesting and is well shown on this page, as is also the relation of their number to the population. Every state has some motor boats and New York, the largest number, about 37,000.



The Amateur's Log Book

by

William Harnden Foster

WHERE can a motor boat enthusiast find more interesting reading than in the well-worn, tar-scented pages of a ship's log-book? Take, for instance the records brought home by those dauntless New England captains of a hundred years ago, in the days when Salem ships were seen in every port on the globe, and our merchant-marine led the world. Carefully and painfully inscribed on these musty pages one can read chapters that might well have been misplaced from "Robinson Crusoe," or "Treasure Island." There are grim stories of shipwreck and long wanderings in the interiors of strange lands; there are matter-of-fact accounts of engagements with Tripolitan pirates; there are touching records of the home-comings, laden with East Indian cargoes, after years of storm-tossed absence.

And how happens it that when one reads these records he can hear the singing of the wind through the rigging and almost taste the salt on his lips? Is it because these old sea-rovers of a century ago possessed literary ability? No; but because they wrote of facts—facts that were freshly and vividly stamped on their minds.

And now to the point of this article. Most of our boats are still in winter quarters, although some are already in commission for another season afloat. But when it comes right down to hard pine planking, what have you to show for the season of 1912? yes, and for many, many previous ones? "Pleasant memories," you answer, and you are right; they are pleasant memories. But do you ever stop to realize that every day draws these memories a little farther back into the distance of memory? There are certain events that stand out in such clear detail that they might have happened yesterday. These you will never forget, but the general run of events is growing gradually dim.

"Say, do you remember that foggy night you ran from Point Judith up Buzzard's Bay and how you picked up Hen and Chickens lightship dead ahead? That was sure some calculation—tide running, too. How long did it take?"

"Don't just remember—wish I did. Might take the run again some time and compare notes."

"Do you remember next day seeing that string of battleships? Wasn't that some sight? How many were there now?"

"Can't quite think."

"Wasn't that cove behind the little wooded island in Casco Bay the quietest, safest little anchorage you ever saw? Do you remember how you went ashore and had a clam bake under the fir balsams? Say, what wouldn't you give for a picture of that little cove, with your boat in under the shore and casting a perfect reflection on the water?"

The one way to preserve the memory of these events, so dear to a motor boat enthusiast, is to put them down in black and white. Before your motor boating season of 1913 opens, begin a log-book. It doesn't have to be confined to any particular form. You are the boss—suit yourself. Get a book and write things down as they happen. Start with the early days of spring—the day you uncover your boat, and scrape a little on her. Write down what kind of paint you used and how much it took. It may be useful information later on. Make a note of what had to be done to the engine and how to do it.

You don't have to be literary any more than the old Salem skippers were. You are going to write facts, too. Never fear, they will be interesting all right.

The book itself may be almost anything. It is advisable to choose one that is of a convenient size to carry on the boat and one that will stand plenty of wear. The best thing you could possibly obtain is a well bound book with linen pages. By using waterproof India ink, such a book will withstand dampness and hard usage.

Make a rack for your log-book in some convenient place, with pen and ink handy.

You may prefer to make the book a more elaborate affair—a sort of parlor table volume. If so, maintain one less elaborate on shipboard and then copy from it at the end of each cruise.

Next of importance to making the actual entries in the log-book itself, is to take photographs to illustrate it. Get the camera habit. At the present time the so-called kodak and supplies have reached such a stage of perfection, that any man who can start a gasoline engine or steer a course, will find little trouble in taking satisfactory snapshots. Buy a camera and don't be afraid to use it. For how many of us have started off on a trip with fine intentions and plenty of films, day after day neglecting to use them! "Will get that on the way back," we say. But "the way back" on the sea is exceedingly crooked and some times dark. How often, oh, how often, did we come back with the films still packed! Let me repeat. Don't wait for pictures that will make the artistic world sit up and take notice. The simpler things, a bell-buoy, a ledge, or a gull, will find a welcome place along with your text. Don't bother about composition or poses. The art of amateur photography comes in getting interesting pictures. These are usually the ones obtained in some random shot when your subjects least expect it.

If you finish your own pictures, take unusual care with the ones you wish to put in your book. Remember that your log-book is going to become a family treasure to be handed down to generations to come. A faded or discolored print must, under no circumstances, mar its pages.

A person who enjoys pen-and-ink sketching can make an unusually interesting log-book by varying his photographs with a few sketches—perhaps something a little humorous, or of subjects that he was unable to photograph. Like the photographs, such sketches need have no artistic merit. Let them simply express an interesting idea, and you will find that their merit proves itself as time goes on.

Now, before the opening of

With the aid of the log book and a little imagination the cruises may be lived over again during the off season.

the season, get your book and your camera ready to begin volume number one. Don't miss a day's entry when you are aboard. Make it as formal or informal as you choose, but be sure you make it something. Then next winter as you sit around the fire and think over your past season, even as you are doing now, you may glance through your log-book. Every picture and every line will bring back freshly and vividly the happenings of former days. You can enjoy many a delightful cruise while the snow blows outside. Then your log-book will be a source of pleasure and pride to you, and something that you will prize as the years go by.

Then, too, there is always the possibility of writing up the log afterward as a story for one of the magazines. By no means all of such articles are done by experienced writers and if your cruise is an interesting one, there are others who would be glad to read of it.

The Permanent Mooring.

Suggestions for the Choice of the Anchor, Cable and Buoy with Best Methods of Arranging, Laying Out and Picking Up.

By H. W. Loweree.

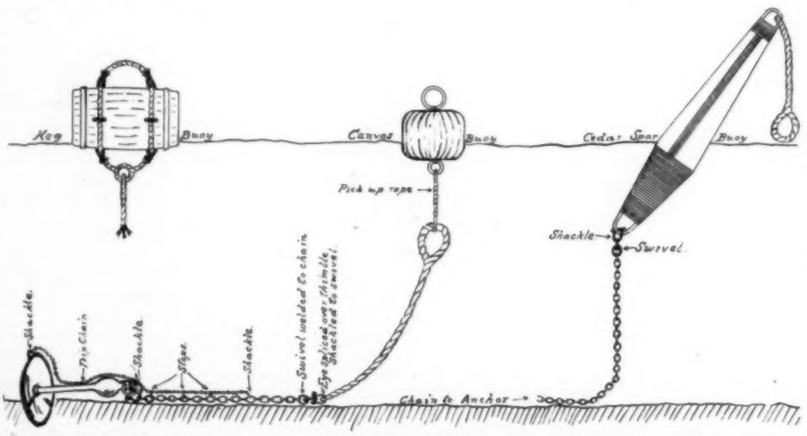
ON A Sunday afternoon did you ever sit with the rocking chair fleet on the club-house piazza, with the wind blowing fifteen or twenty knots, and watch the home-coming yachts pick up their moorings? Note the wind-jammers who usually make it the first time: then the auxiliaries with their sails furled chugging in under power: then the cabin cruisers and high-sided fellows who miss it more times than all the others put together. Most of the latter helmsmen did not learn the game with a sail boat, for their usually come down the wind, shut off or reverse their engine, or go by so fast that the man with the hook misses the buoy and the line often gets wound up in the propeller wheel. Sometimes they come up beam to and through in the clutch, with the result that the bow is blown off to leeward so far that the longest boat-hook could not possibly reach the buoy.

There is considerable windage on a high-sided motor boat and the proper way to make the mooring is to round up into the eye of the wind, several boat lengths away, and slow down, and you can often pick it up better by throwing the clutch on neutral instead of reversing. Reversing throws the bow away from the straight line, owing to the change of torque at the propeller.

The old saying that "The best insurance is a good ground tackle," has been modified somewhat for the insurance companies are now alive to the fact that there is profit in underwriting the smaller craft. However, the old saying is a good one, after all, and with more care on the part of the yachtsman and a lower loss ratio for the companies, there is a probability of a lower premium cost for the owner.

As to the weight and type of moorings, this varies largely with the size of the boat, location and the quality of the bottom. It is always best to be on the heavy side rather than too light.

The bulb shank mushroom is excellent for holding. To this shackle a good chain, suitable in size to the weight of the anchor, and of a length not less than six times the depth at high water and ten times is better in exposed places. To the upper end, put in a swivel which should be one-eighth or one-quarter of an inch heavier than the chain itself, for this is the place where most of the wear will come, and then splice in a heavy piece of manila rope, not less than seven-eighths of an inch in diameter, with an eye splice to throw over the bitts. Sew heavy canvas or rawhide on the part that passes through the chock to prevent chafing.



Several practical buoys and a method of ar ranging the mushroom anchor and cable.

Just below the eye, splice in a short pennant of lighter line, about six feet long, and attach a buoy that will *float* the entire season at least. Cork buoys soon become water-logged and set so low in the water that they are hard to find. Metal ones scratch the sides of the boat, get punctured and sink. Wooden kegs, with galvanized iron rod run through with eyes on each end, are good, but the best of all is the cedar spar buoy that stands up; can be seen at a distance; is handy to pick up, and is not likely, when you are away, to be cut off by other power boats. These buoys are made on the principal of the government spar buoys, and, if kept well painted, will last for years.

Before dropping your mooring in place, it is a good plan to have a light chain fastened in the eye on the disk and stopped up along the main chain with marlin to within reaching distance at low water. This will greatly facilitate matters for, in case you might wish to move the mooring, it will only be necessary to overhaul the main chain until you come to the upper end of the lighter chain. A light strain on this will break the marlin seizings and give you a direct pull on the disk edgewise, and it will then require only a comparatively small lifting power to break it out.

To lay out a heavy mooring, two flat-bottom rowboats with a couple of timbers lashed across them to the thwarts, will carry or raise a mooring up to half a ton. Lash the mooring to the timbers between the two rowboats, and when you get over your previously marked spot, cut the lashing, being sure to have the chain clear for a quick run.

Raising the mooring is more of a job, and my advice is to leave it down, as it will last longer under water than on the beach. Take a cross bearing, from the shore, with prominent stationary objects, so that the apex of an acute angle is the point at which your mooring lies. When you haul out for the Winter, stretch out the chain, and, after having put a weight on the rope end of your outfit, drop to the bottom. In the Spring you can easily pick up your mooring again by dragging over your range with a grapnel iron being sure to fasten on a trip-line with a float, so in case you hook the chain near the anchor, or get fast on the bottom, you will not lose your grapnel. The chain usually sinks in the mud and you will probably have little trouble in hooking the rope. Splice on a new piece of rope and you are ready for the season. Another method that I have successfully used was to run a line to a neighboring mooring, let this drop to the bottom, and, then, when dragging over the range in the Spring, you will kill two birds with one stone.

Below is given a table of the weights and strength of various sizes of rope and chain and the sizes of mushroom to use with them for boats of several lengths in both protected and exposed anchorages. These may be safely relied on, but for special conditions or when in doubt, make the tackle too heavy rather than too light.

ROPE			CHAIN						FOR BOATS	
Size. Diameter.	Number of feet per lb.	Breaking strain-lbs.	Size Dia.	Weight per Foot in lbs.	Proof Test Tons.	Breaking Strain-Tons.	Mushroom weight-lbs.	Shackles & Swivels	In Sheltered Harbors	In Exposed Waters
3/8	6	3970	1/4	.91	3/4	1 1/4	50	3/16	18-20'	14-16'
7/16	5	4900	5/16	1.5	2	4	100	7/16	20-25'	16-20
1	3-6"	7050	3/8	2.5	4	6 1/2	165	7/16	25-30'	20-25
1 1/8	2-4	9600	7/16	4.1	6	11	200	1/2	30-35'	25-30
1 1/4	2-1	11020	1/2	5.8	8	14 1/2	265	5/8	35-40'	30-35
1 3/8	1-8	14150	5/8	7.7	10	18 1/2	300	1	40-50'	35-40
1 1/2	1-5	15870	1	10	13	22	400	1 1/8	50-75'	40-50
			Burden Handmade 25% Stronger. Safe Working Load 1/4 Breaking Strain.							

A tabular guide for the choice of a safe mooring equipment for various sizes of boats, in both sheltered and exposed waters.

Putting the Boat Into Commission.

Schedules to Be Followed When Doing the Work, Time Required and Materials Necessary for the Medium Sized Craft.

THE PRIZE CONTEST—Answers to the First Question in the March Issue.

Good General Advice.

(Prize won. Supplies from C. D. Durkee & Co.)

IN FITTING out, first thoroughly air the boat and let the sun get in as much as possible. Examine the paint on the hull, if a number of coats have been applied and it is peeling off in spots the only way to make a job of it is to burn off all the old paint (or use a paint remover), and get right down to the wood. A torch may be had with the scraper attached which is most handy for this work. An excellent remover which takes hold of either paint or varnish is a mixture of acetone and benzol.

The first coat of paint over bare wood should consist of white lead with just enough turpentine to break up the lead and well thinned with raw linseed oil and a dash of japan dryers. Three light coats is much better than two heavier ones, the finishing coat may be a good grade of yacht white or add one gill of varnish to one quart of paint mixed as above. A little prussian blue added to white paint prevents it from turning yellow. More oil makes a hard glossy surface while more turpentine makes a flat white, but if too much turpentine is added the paint will rub off like whitewash.

If the bright work is badly weathered it will have to be scraped or removed as with the paint. If scrapers are used, flat cabinet scrapers are best. Sharpen with a bevel edge like a chisel and slightly turn the edge by rubbing with a round piece of steel. A handle may be obtained for these scrapers which makes the work much easier. If the oak is weathered it can be bleached to natural color by applying a saturated solution of oxalic acid and washing off with common vinegar, rub down with fine sandpaper and apply two coats of best grade spar varnish. This work must be varnished before rain or dew gets on it, or the work will have to be done over again, for if wet the tannic acid will come out of the oak and turn it black.

The hull below the water line should next be examined. If any seams are open try them with a putty knife and if soft, lightly calk with spun cotton. Putty all the seams, but do not use the common variety, there are excellent seam compositions on the market, if not obtainable a mixture of white lead and whiting to the consistency of putty makes a good material for this work. It is advisable to run a little thin paint into the seams before applying this composition.

For the bottom a number of good anti-fouling paints can be purchased. I have found that 8 oz. of powdered copper mixed with one qt. of varnish makes a hard smooth surface and will last an entire season in salt water without marine growth of any kind. Two coats will be sufficient and the second year

Now come the decks for which I advise special deck paint which is more lasting, but if varnished rub down well with fine sandpaper size O (carborundum paper is the best), and apply two coats of best grade spar varnish.

The stuffing box should be looked over and if any trouble existed last season, take out the old packing and replace with square braided flax which comes prepared for this purpose. Cut two or more rings to fit the shaft and be careful not to set up too tight.

The power plant and interior may be overhauled on damp days or after the boat is afloat as it is advisable to get the boat in the water as soon as possible after the bottom is complete to prevent further drying out.

If the engine is in need of paint give it a coat of special heat resisting enamel which may be obtained from any dealer, first thoroughly cleaning off all dirt and grease with kerosene or gasoline and then rubbing over with fine sandpaper. It is better to have done this job in the fall when the boat was hauled out, as paint is the best protection for metal during the winter.

Put in a new set of batteries and go over the wiring, rubbing off all connections with fine emery cloth. Look over the spark plugs and with gasoline in the tank you are ready for a try out.

The time required to put a boat in commission depends upon the condition of the boat and the necessary work to be done and very largely on the experience of the man who does the job. At a yard where mechanics do the work and have everything handy, two men would put a 30 foot cruiser in commission in four or five days of good weather. The amateur who does his own fitting out and has only Saturday and Sunday to do the work should begin as early in the spring as the weather permits as he will be handicapped by a rainy or damp Sunday, unless the boat is under cover and it is a waste of time and material to paint or varnish on damp days.

The following material should be sufficient to put the ordinary 30 foot power cruiser in commission, costing approximately $18.00.

25 lbs. white lead	$2.00
1 gal. raw linseed oil	.65
½ gal. turpentine	.30
1 qt. japan dryers	.25
1 qt. yacht white	1.25
1 qt. special deck paint	.55
1 gal. spar varnish	4.25
1 lb. powdered copper	1.00
1 lb. whiting	.04
1 small can engine enamel	.30
5 lbs. seam composition	1.00
1 lb. oxalic acid	.18
1 lb. calking cotton (fine)	.18
1 calking or making iron	.40
1 putty knife, 1¼ in.	.20
1 scraping knife, 3 in.	.30
2 cabinet scrapers	.20
1 doz. sheets sandpaper, size O (Carborundum is best, cost 45c per doz.)	.10
2 flat 3 in. paint brushes	1.50
1 flat 1 in. paint brush	.25
1 flat ½ in. paint brush	.15
1 flat 2 in. rubber-set varnish brush	.45
1 set dry batteries (waterproof)	1.50
2 qts. varnish remover	1.20
Total	$18.20

Proposed schedule for putting a 30-foot motor boat in commission.

First Day: Weather clear	Air thoroughly and let the sun get in. Remove paint from top sides, using torch or paint remover.
Second Day: Weather clear	Sandpaper top sides and give the scratch coat, use little turpentine and plenty of oil, calk and putty seams below W. L.
Second Day: Weather rainy	Take under cover the spars, flag poles, oars and anything movable to be varnished, scrape and sandpaper them.
Third Day: Weather clear	Scrape or remove varnish from rails and other bright work, sandpaper and varnish together with other small articles.
Third Day: Weather rainy	Clean all grease from engine with gasoline, rub all wire connections with emery, do any woodwork necessary in cabin.

Questions for the July Contest.

1. Explain a method of handicapping boats in a club regatta which will not be too complicated, but still allow every contestant a fair chance to win.

Suggested by F. E. H., Toledo, Ohio.

2. What is the proper equipment, supplies, etc., to be carried on a small boat bound on a two weeks' cruise, and how may these best be carried?

Suggested by B. B., Miami, Fla.

3. Explain and illustrate the construction of an engine bed, method of fastening it to the boat and the method of fastening motor.

Suggested by F. E. Benson, Oak Park, Ill.

Rules for the Contest.

Answers to these questions, addressed to the Editor of MoToR BoatinG, 381 Fourth Ave., New York, must be: (*a*) In our hands on or before May 24, (*b*) about 500 words long. (*c*) written on one side of paper only, (*d*) accompanied by the senders' names and addresses. (The name will be withheld and initials or a pseudonym used if this is desired.) Questions for the next contest should reach us on or before the 24th of May.

The prizes are: for each of the best *answers* to the questions above, *any article* advertised in MoToR BoatinG, of which the advertised price does not exceed $25, or a credit of $25 on *any article advertised* in MoToR BoatinG, which sells for more than that amount.

(*There are three prizes, one for each question, and a contestant need send in an answer to but one if he does not care to answer all.*)

For each of the questions selected for use in the next contest, *any article* advertised in MoToR BoatinG, of which the advertised price does not exceed $5, or a credit of $5 on *any article advertised* in MoToR BoatinG, which sells for more than that amount.

For non-prize-winning answers published we will pay space rates.

When you send in your answers, state what you will take if you win a prize.

Fourth Day: Weather clear	Lightly sandpaper bright work, paint decks, give bright work and top sides second coat.
Fourth Day: Weather rainy	Get dink under cover and prepare for paint or varnish. Examine stuffing box, steering gear, reverse gear and bolts in engine bed.
Fifth Day: Weather clear	Paint engine with heat resisting enamel. Put final coat on top sides, using special yacht paint. Finish up the dink.
Fifth Day: Weather rainy	Thoroughly clean the cabin, scrub the paint and floors. Clean out bilges under floors, get in a hose stream if possible.
Sixth Day: Weather clear	Paint the under body, using copper bronze for salt water. Do all the small jobs that have been left to the last.
Sixth Day: Weather rainy	We hope not, but if you have no rainy day jobs, help the other fellow, you may need his help in launching or other heavy job.
Seventh Day: Weather rain or shine	Get the boat in the water and finish the interior and other left over jobs at the mooring and try her out.

H. W. Lowerre, New York City.

* * *

Data from Actual Work.

THERE are stored in a boat yard at Huntington, L. I., 68 motor boats of various types. In length they range from 12 to 65 feet. The aggregate length of these craft is 2072 feet so that the average length of the yard full is 30.4 feet; the average width by the same process is 8.2 feet; the draft 2'-2", the freeboard 3'-11". The motors of all of these craft total 1056 h.p. One boat has 16 cylinders in its power plant and ten of the fleet can boast of but one, 29 of the motors being 4 cycle, 38 two cycle and one a steam engine. A total of 156 cylinders which allows each boat 2.3 cylinders, developing 17 h.p. So a medium sized boat tabulated from these 68 representative craft is of the following dimensions:

L. O. V.	30'- 6"
Width	8'- 3"
Draft	2'-10"
Freeboard	3'-11"
H.P.	17

Whatever work there is to be done toward putting the power plant into perfect order should be done first, for it is a messy job at best. The bearings of the motor should be looked after and if worn must be refitted. Clean out carbon from cylinders and from pistons, and if a four-cycle motor, grind in the valves; see that all springs are resilient and that there is a proper clearance between valve stems and valve lifts, that all gaskets in manifolds and packing in water connections are perfect. The reversing mechanism will require a thorough cleaning and perhaps an overhauling. Look for weak places in the gasoline connections and tank, the only source of danger on a motor boat. If necessary, instal a new tank with its fittings. Don't take any chances with gasoline. On completion of the motor refitting attend to faulty plumbing. Carefully inspect the steering gear and then begin on the outside work.

Begin with the upper work. Scrape and varnish hatches, skylights, mouldings, standing top, spars, etc., first. Scrape, sandpaper, and varnish or paint cockpit, then expend your efforts toward brightening up the decks, next the topsides, sandpapering them thoroughly after dressing down, paying and puttying the seams if they require it. Use flat yacht white or colors for topsides. It's cheapest and best.

The bottom should be reserved for the finishing touches. View with suspicion the stuffing box and water inlets and outlets. They've a great habit of leaking. Dress down all seams, and treat similar to those on top sides and apply two coats of anti-fouling paint.

The materials required for replacements on a 30-foot cruiser which has had reasonable care through a five months' season afloat are approximately as follows:

MATERIALS FOR WORK ON BOAT.

18 sheets garnet paper	$.36
1 gal. varnish	4.00
1 gal. flat white	2.40
½ gal. red lead	1.30
½ gal. bronze bottom paint	3.00
2 lbs. putty, white lead, etc.	.30
½ gal. gasoline	.10
3 1-in. No. 12 brass screws	.02
1 gal. varnish remover	2.60
1 can Dutch Cleanser	.10
½ lb. galv. nails	.04
Total cost materials for boat	$14.22

Time for work on boat, 102½ hrs.; approximately, 11⅓ days.

MATERIALS FOR WORK ON MOTOR.

2 sheets emery cloth	$.10
½ pt. engine paint	.15
6 cotter pins	.05
5 oz. Mobilene packing	.30
5 inches 1-inch brass pipe	.10
1 1¼-inch pet-cock	.30
1 ½ x 4 carriage	.05
1 lb. waste	.16
3 set screws, 7-16 x 1, ⅜ x 1½, ⅜ x ¾	.22
5 batteries	1.25
4 battery connectors	.04
1½ lbs. grease	.30
Total cost material for motor	$3.02

Time for work on motor, 75 hrs.; approximately, 8⅓ days.

Total materials.....$17.24
Total time 177½ hrs.....19⅔ days

These are exact costs and time of a 30 x 8' 6-day cruiser, overhauled this spring.

William Atkin, Huntington, L. I.

* * *

A Comprehensive Schedule.

IN DEALING with this subject, I will assume the boat when hauled out to have had the care it deserves. The bilge will be clean, the motor, toilet, stove, electric apparatus and all stores on shore where they have had a thorough overhauling and made ready for immediate use. Careful observation at this time (hauling out), will have shown many little things requiring our attention at the fitting out season, and notes made that nothing will be overlooked, and needless trips required to procure supplies. Let us make a list or scheme of procedure something like the following:

1. Hull: (a) interior, (b) exterior. The interior into (I) bilge, (II) top sides. The exterior into (I) deck, (II) hull.

2. Fixtures: (a) toilet, (b) steering gear, (c) gasoline system, (d) electric outfit, (e) motor, (f) galley, (g) bilge pump or patent syphon, (h) power whistle.

3. Rodes and stores, such as lines, anchors, lights, life preservers, compass, etc.

After removing the winter housing, brush away all dust and debris before opening the boat, and note any additional damage calling for attention and make notes in the scheme under the proper heading. Then pass into the interior. Make a careful inspection of the bilge. Be sure the timbers, planking and all hidden woodwork is in good condition. If not make repairs at once and clean and finish according to your ideas, i. e.—paint, wood preservatives or ventilation. Examine and replace all gaskets necessary around the outboard connection valves of motor and toilet. (Wood preservatives may destroy rubber, so be careful.) This done, note condition of lockers, etc., and repair any damage, tighten screws, locks, etc. Dry the interior thoroughly preparatory to painting and varnishing, using the best obtainable interior finishes, which are cheaper in the end. You will be more than pleased if beaded, curved or other fancy mouldings are absent.

While the first coat is drying the toilet and wash basin may be set and securely fastened. Finish it and check it off the list as should be done with each thing, then nothing will be overlooked. The toilet may be followed by cables, wheel, fair leaders, shipping the rudder, after setting the shaft and propeller and close attention to the steering gear, i. e., attaching quadrant or tiller. Pack the gland if it has one. Oil the pulley bearings carefully, test, and check off. Now give closest scrutiny to the gasoline system. See that all joints are tight. A small quantity of ether under about 5 lbs. pressure will show where the leak is to be found if the gauge shows the system to be faulty. Set all joints in shellac. Indeed this substance is of untold value on a boat. Clear the filter and a gallon or two of gasoline may be poured into the tanks to test the tightness of valve seats. There must be no leaking.

The propeller, fastened to the shaft on a taper seat with nut and key has been set and its stuffing box—always inboard—packed. We are ready for the exterior. Having made all necessary repairs, calked seams or restored canvas, set the hardware, they may be necessary, and finish using only the best material whether in payed seams, varnish or painted canvas. Replace the moldings and finish the topsides. Since a priming coat was put on in the fall, one or two coats at this time will finish it beautifully. Now finish the bottom.

I purposely proceed in this manner, and wait two full days at least before putting over so that paint will set nicely, in the meantime, putting several inches of clean water in the bilge. This may save a lot of trouble and prevent sinking. Once afloat and secure, I examine all wiring, testing each circuit on the board by means of a storage cell which is always ready since makers' directions are followed exactly. But a set of dry cells may be used for this purpose. This done, I set the motor, lining up while afloat. I maintain this to be the only logical procedure on a small craft, to avoid friction in the bearings. I also believe the motor and clutch mounted immovably on angle iron to be the safest plan for the amateur.

This brings us to the bilge pump. The fairways are free, since the bilge is clean, but a length of jack chain through the openings will serve to clear them if moved from time to time. Provide a screen well at the lowest level into which the pump is inserted. Any chips or foreign matter overlooked will thus be kept from the pump and not choke it. It is always well to have a hand pump in case of emergency.

The galley needs but little attention, since most of its appliances are movable. The water tank and piping will be well treated, if a liberal supply of strong soda solution is sent through the system, washing all into the sink finally with fresh water. The ice box may need some attention, if it is fixed. Be sure no rot is occuring around the more hidden parts. The power whistle may now be connected up, and tried by running the motor for a short spell, and observing the gauge. If it holds, the system is ready for business.

We come finally to the group 3. Have everything connected with this lot of the best and be repaid in comfort and safety.

As to cost. This naturally varies with the kind of material used. I may safely say a $10 bill will cover all paint and varnish expense and give good results on a 22-footer, using it liberally inside and out. Exactly the cost I cannot state since I kept no record. I used an excellent grade of material for all work and was amply repaid for the slight additional expense and the trouble of taking a little pains by seeing my boat last through the season without further attention.

Fitting the Garboard Plank.

The Proper Method to Follow in Its Bending and for Obtaining the Correct Bevel for the Rabbet.

THE PRIZE CONTEST—Answers to the Second Question in the March Issue.

Understand the Plans Before Starting.

(Prize Won—Paragon Reverse Gear.)

THE job of cutting the rabbet in the keel and fitting the garboards is one requiring care and accuracy, and if not properly cut will cause no end of trouble. The inner edge of the seam formed by the garboard and the keel is the part that should be tight. If the seam is V-shaped a little with the widest part of the V on the outside, it is considered a good calking seam; while, if these conditions are reversed the seam cannot be calked tight and will leak. On the other hand, if an excessive bevel is given to the seam the calking iron is apt to pry off the plank when calking.

If the lines of the plan are understood the rabbet can be cut with very little trouble while the keel is on the floor, but as a great many amateurs do not understand them, the following method may be employed.

Prepare a piece of pine about a foot long by ½" wide and the same thickness as the proposed planking, and bevel one end of it, making the bevel about one-eighth of an inch to a thickness of one inch, as shown at "A." This is called a template. Be sure to mark the outside of the template with a round-headed tack or some such mark, so it may be easily distinguished, which is the outside and which side is to be used for the fitting.

Now set up the keel and moulds in their proper places, and by cutting out at each mould so that the rabbet line is flush with the outer end of the template, as shown at "A," you have several spots to guide you, and you can then draw a pencil line to cut to by tacking a batten so that it runs fair from spot to spot. The moulds can now be taken down and the rabbet cut out to the lines made. If in doubt, it is safer to cut the rabbet a little less than the full depth, for you can slice off a shaving or two when the frames are fitted in, if not deep enough.

To find the shape of the garboards, get two spiling boards about three-eighths of an inch thick, six or eight inches wide, the length to equal the length of the boat. Cut these so that their ends fit roughly in the rabbet forward and aft. Tack the forward one fairly close up to the rabbet and bend along the frames close to the keel, being careful not to spring the board edgeways up or down. Then tack the after length in aft, in the same manner, and when it laps the forward one, saw them through here, cleat and fasten them firmly together.

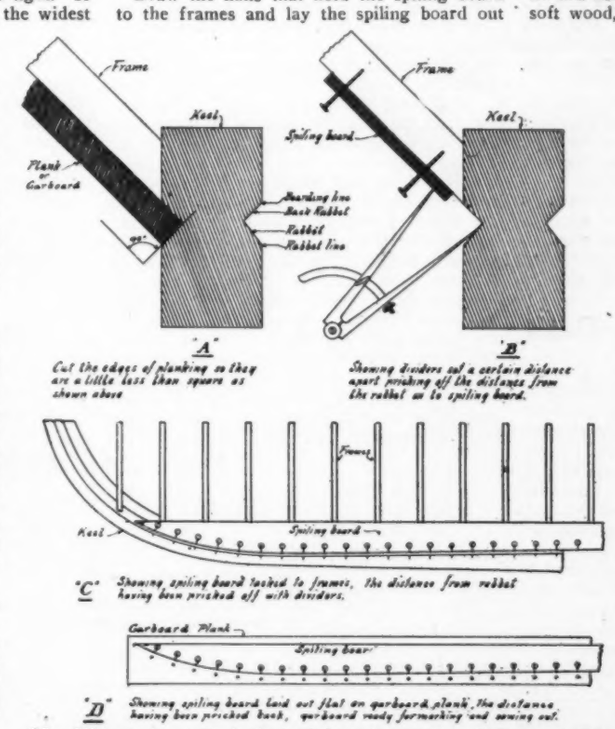
Now set a pair of dividers so that the legs span the greatest opening between the edge of the rabbet and spiling board, and at intervals of six inches draw pencil marks so they are square to the rabbet, and on these lines prick off the spacing set on the dividers. Stick the point of the dividers in the spiling board and put a small circle with a pencil around the mark so it may be easily seen, as shown at "B" and "C." With a row of these marks all along the parallel to the edge of the rabbet and the pencil marks to guide the direction which the distance the dividers are set apart is to be set back it is merely a case of accuracy in getting out a perfect fitting garboard.

Draw the nails that hold the spiling board to the frames and lay the spiling board out flat on the plank the garboard is to be cut from, and with the dividers still set, prick back the same distances, which will leave a row of prick marks to bend a thin batten along, and pencil in the line to saw to, as shown at "D."

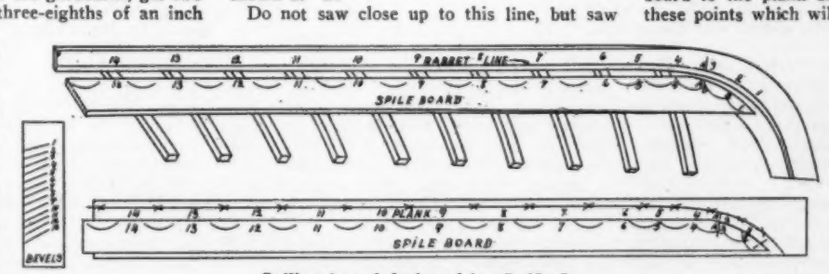
Do not saw close up to this line, but saw the garboard out to within one-eighth of an inch of the line which will give some leeway for fitting.

Now clamp the garboard in place and see how it fits. If it is a quick twisting bend as most are, steam it and clamp it on hot, letting it cool in that position, and when cold and set, slack up on the clamps and fit the garboard at any places where it can be improved.

JOHN CLITHEROE, Attleboro, Mass.



Mr. Clitheroe's method of obtaining the angle and shape of the garboard strake.



Spiling board designed by C. H. C.

A Practical Plan.

BEFORE fitting the garboard strake, see that the rabbet is properly cut and is of the right depth, so that when the plank is in place the outside will just come to the rabbet line. Then you will need a spile board or "spiling staff" as it is often called. This can be from 4 to 6 inches wide and as long as the longest plank you intend to put on and about ¼" thick. It should be of some soft wood, preferably white pine.

Cut the forward end of this spile board so it will roughly fit the rabbet and clamp or tack on the frames, close to the keel and in the same position you wish to have the garboard strake. Care should be taken to have the spile board lie flat on the frames and not to spring it edgeways.

Now set a pair of dividers so they will reach from the rabbet line, well onto the spile board. Place one leg of the dividers on the rabbet line and strike a small arc on the spile board. Continue this at intervals, making them closer near the stem where there is more curve. Near the forward end draw a line across spile board and stem so the garboard plank can be located in the same fore and aft position as the spile board was in. Or a line may be drawn even with some frame for the same purpose.

Opposite each frame make numbers on the spile board and also on the keel. These are used to locate the bevels. Remove the spile board and place it on the plank to be used, tacking it in two or three places to hold it in position. Now, with the dividers spaced same as before, strike two small arcs on the plank, using the arc on the spile board for centers. Where these lines intersect is the edge of garboard. Continue this for the length of plank, and draw a line through these points and this will be the edge of garboard that will fit the rabbet. The idea is simply to locate points on the spile board parallel with the rabbet and then to transfer the same distance from points on spile board to the plank and draw a line through these points which will fit the rabbet. Before removing spile board, draw the line on the plank for locating fore and aft position and mark the numbers on the plank opposite those on spile board for locating bevels.

To get the line for outer edge of garboard, tack a narrow batten on the frames just where you wish the edge of plank to be, and take the width from this to rabbet about every two or three feet and transfer to garboard plank. With a rip-saw cut the plank out to these lines, being careful to saw so as to leave all the lines on the plank. With a bevel square take the bevels at each frame or opposite the numbers and transfer to a small board, as shown in sketch, numbering each.

The next step is to place the plank with the edge up in a vise or clamped to some upright.

Then with a draw-knife cut a small spot to the proper bevel opposite each number and draw a line across edge of board to locate exact place. The bevel square to be set from the bevels on the board opposite the corresponding number. In cutting these bevels, make them so the seam will be slightly open on the outside for calking. Now, with the draw-knife, cut away some of the wood between these spots that are beveled and then finished with a plane.

If care is taken in doing all the work and the wood is cut exactly to the lines, the plank will need very little fitting. Before putting the plank on, pour some boiling water on the forward part where there is much twist. Put the forward end in rabbet and clamp in position, then follow back towards stern with more clamps, twisting the plank into place. When well under the boat, shores can be used to advantage.

In locating the fore and aft position of the plank by the lines provided on plank and keel, place the plank slightly aft of where the lines indicate as it can easily be driven forward after it is twisted and clamped in place.

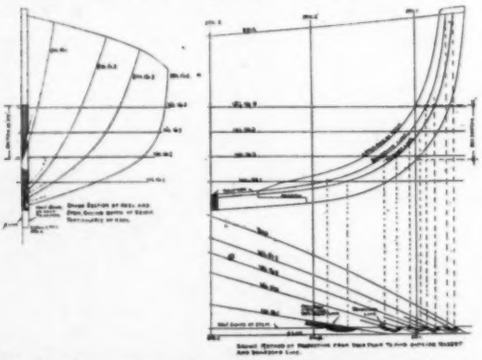
The forward end should be fastened with screws, for if nails are used, a slight tap with the hammer will sometimes cause the plank to split.

C. H. Christie, Saginaw, Mich.

* * *

Working from the Deck Plans.

THERE are several methods of obtaining the bevel for the rabbet in the stem and keel; these bevels determine the proper bevel of the garboard plank. The most used, probably, is the old rule of thumb method of frequent cutting and fitting; that is, after the keel and stem are erected, by cutting the rabbet until a batten the thickness of the plank-



Mr. Davis recommends working from the plans of the boat to obtain the angles and dimensions.

ing will "lay right." The rabbet is cut deep enough and at such a bevel as to keep the beveled edge of the garboard plank at nearly right angles to its surface; in other words, a shim edge is to be avoided, since it is difficult to fasten without splitting and is very liable to open up later.

A better and more accurate method is to get the bevel and depth of the rabbet in the stem and keel from the lines of the boat as laid down full size. A very simple way to do this is to lay off on the deck plan at the bow the half siding or half thickness of the stem; also do this on the section plan. Cut a small piece of board about a foot long, two inches wide and the thickness of the planking, being careful to have the ends square. Where the water lines intersect the line of the half thickness, lay this small piece on its edge, and mark around it, as shown on the drawing. This will give the "bearding line" (diminishing line of the long bevel), the depth of the rabbet and its bevel. To lay this off on the stem itself, one must project these points to the profile plan as shown. It is then a simple matter to make a template of the stem showing these lines and transfer them to it, preferably before erecting same, for the rabbet can be cut much more easily while the stem is on the floor or benches.

To get the bevel of the babbet on the keel, use the small piece of board as before, this time on the section plan. Be careful again to have its end come at the intersection of the half thickness of the stem and the line of the outside of the plank. Most boats have their lines drawn to outside of plank, and the thickness of the plank afterward deducted on the full sized lines from which the moulds are made.

After the rabbet is cut in the stem and keel, these set up and the boat is in frame, the shape of the garboard plank can be gotten as follows: Procure a thin batten about one-quarter of an inch thick, five or six inches wide and ten or twelve feet long; a pair of dividers or a small block about 2" x 3" having its edges beveled and a screw in its center by which to hold it. The block will give a more accurate result than the dividers, which are liable to shift, while the breadth of the block is always constant. Pare away one end of the batten until it roughly fits the rabbet in the stem. With a few small screw clamps fasten it securely to the frames, being very careful to let it *rest where it will*. Do not attempt to bend it edgeways. In this seemingly unimportant point is the secret of the whole operation. Then with the block or dividers go along at frequent intervals (very frequent at stem), and spot off equal distances (the breadth of the block or setting of dividers), from the outside of the rabbet, having previously drawn lines on the batten where it crosses the frames. The intersection of these lines with the arcs of the circles or breadth of the block will give a series of points or "spots." It is best to have the batten lie as close to the keel as possible. This operation described above is called "taking the spiling."

Lay this batten on the garboard plank to be and secure it with clamps or a few small nails. The points are transferred to the plank in the same manner they were taken from the boat, using the block or dividers. Run a thin batten through these points to get a fair line, and after laying off the width of the garboard (which is arbitrary, usually about 6" to 8" at the butt), it can then be sawn out ready for the bevels. The bevels can now be "lifted" directly from the stem or keel and applied to the plank, being very careful not to get them on backward.

After the plank is ready and faired up it is then put in a steam box, or wrapped with cloth or old bags and hot water poured over it. As the plank must be put on with no cracks or split in it, great care must be used to get it hot enough. By means of much coaxing, plenty of screw clamps and blocks, and some patience there is no reason why anyone cannot make a good job of the whole operation.

C. D. Davis, Marblehead, Mass.

* * *

Taking the Spiling.

THE garboard plank is the hardest plank, outside of the "shutter," to fit, but it is very imperative to make a good job of this for there is a great deal of strain along the seam where the garboard fits into the rabbet and if a bad fit is made, leaks will sooner or later occur.

The most common method of fitting the garboard plank is to take a "spiling." Suppose the boat is all in frame and ready to plank. Get a thin, smooth board about ¼" thick; any kind of lumber will do, but it should be pliable. This plank should be a little wider than the garboard is to be and full length; or two lengths can be spliced.

This article refers principally to the fitting of the forward end as this is the most difficult part of the work; for a compromise stern boat the after end of the plank, if it extends to the stern post, will be fitted in a similar manner to the bow end. Cut the end of this spiling plank to roughly fit as in Fig. A; screw or

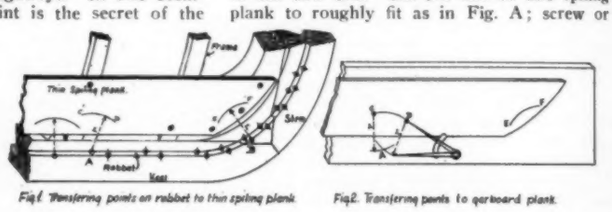


Fig 1. Transferring points on rabbet to thin spiling plank. Fig 2. Transferring points to garboard plank.

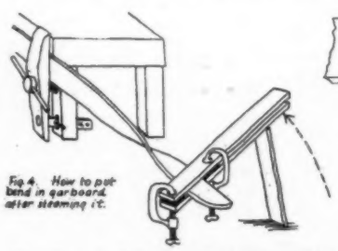


Fig 4. How to put bend in garboard after steaming it.

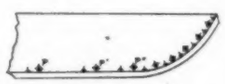


Fig 3. Cut garboard to outside line of points, then inside line (p p' p'' etc) will show amount of bevel, if the edge of garboard is squared up.

Bending and fitting the garboard strake by the method suggested by Mr. Parker.

tack it into place leaving about one inch between lower edge and the rabbet in keel and stem. The board being thin, will require no steaming, but do not bend it up or down by using a bevel gauge. The garboard should now fit the rabbet accurately, but it must, in the majority of cases, be steam bent into place. For small boats the forward end of the plank can be steamed and then clamped and bent over in a vise as in Fig. 4. Bend the end around as nearly to a right angle as possible for it will spring back a good deal when cold. Leave until cold, when a permanent bend will be found in the plank and it can be fitted without much trouble.

If plenty of screw clamps are handy and two or three people on hand to help (which is an unusual occurrence), the plank can be steamed and quickly transferred to the boat and clamped into place against the ribs. This work must be done very quickly though, or the plank will get cold and will not bend, or will split. H. H. Parker, Oakland, Cal.

Supplying Fuel to the Carbureter.

Methods of Installing the Tanks When the Gravity System is Not Feasible.

THE PRIZE CONTEST—Answers to the Third Question in the March Issue.

The Pressure System.

(Prize Won—Credit with Brooks Mfg. Co.)

IN CASES where the gravity system of fuel supply is not found feasible, namely those where the gasoline tank is carried below the level of the carbureter, the simplest method of obtaining "feed" is undoubtedly utilizing the pressure of the exhaust gases. The slight back pressure produced in the exhaust manifold is communicated to an exhaust pressure regulating valve by means of a ⅜" diameter copper tube.

The function of this reducing valve is to so regulate and maintain the required pressure as to cause the fuel to flow constantly and steadily to the carbureter. The valve inlet is connected by a ¼" diameter copper tube to a small hand pump which is needed to supply air pressure when starting the motor after it has been idle for a considerable length of time. A short tube should be run from the pump tube to a small pressure gauge which shows the tension upon the gasoline in the tank at all times. This should register ordinarily from 1 to 3 pounds per square inch.

The valve outlet is also connected by means of ¼" diameter copper tube to the gasoline tank which should be made air tight and somewhat heavier than the ordinary to withstand the pressures contained therein. A 5/16" diameter copper tube runs down into the gasoline tank within 1" of the bottom and extends direct to the carbureter. At some point between the tank and carbureter this pipe should be fitted with an efficient strainer to remove foreign matter such as small particles of carbon, dirt and sediment blown through with the gases; one provided with a pet cock is of advantage as it allows for draining off the water which accumulates in the pipes.

The accompanying sketch illustrates how the necessary fittings for an exhaust pressure system might be fitted to the bulkhead of any motor boat, adding to its appearance and being readily accessible.

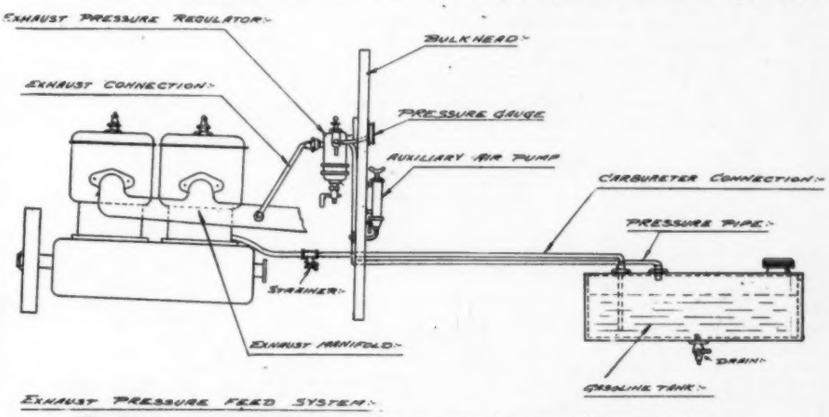
C. E. BRADLEY, Fall River, Mass.

The drawings herewith illustrate a system in which the gasoline or any other liquid fuel is supplied from two or more main tanks, through a small rotary pump to an auxiliary tank, and from there by gravity to the carbureter. The pump is so mounted that the flow of gasoline from the main tanks to same is by gravity and is connected with gears or cogs between the pump and propeller shaft.

Between the pump intake and the main tanks a check valve is placed. From the discharge outlet of the pump a pipe is connected to a small auxiliary tank, which is so placed that the flow of the fuel to the carbureter is by gravity. The size of the auxiliary tank may be as large or as small as may be practical. If no other place can be provided for the auxiliary tank one of small capacity may be mounted directly over the engine. From the upper end of the auxiliary tank an overflow pipe is connected, extending to the main tank. The overflow pipe will be necessary, as the pump will deliver the fuel in excess of what the engine will consume, and to prevent any unnatural pressure in the auxiliary tank, the overflow pipe is provided, through which all the surplus fuel will automatically return to the main tanks. From the outlet at the bottom of the auxiliary tank it is now only necessary to connect to the carbureter, with a strainer and valve in this line, and the entire system is complete.

The system as described will be found reliable and practical owing to the entire operation of supplying the fuel being automatically performed.

F. HORENBURGER. New York.



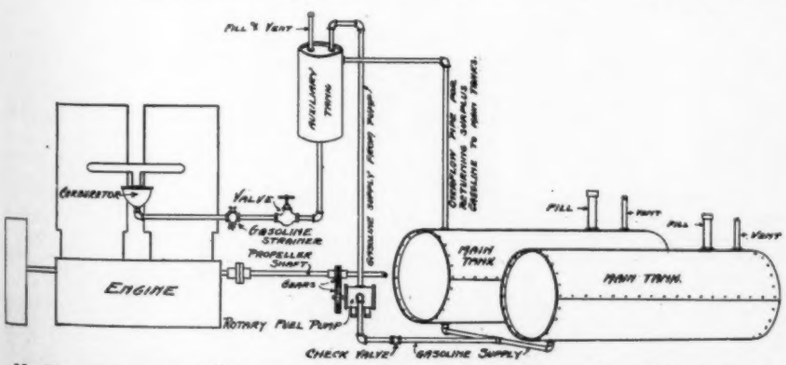
Mr. Bradley recommends a pressure system with an auxiliary air pump.

Several Feed Methods.

OWING to the lay-out of cabin and deck space some motor craft are obliged to carry their fuel supply in tanks so low down in the hull that adequate gravity flow to the carbureter is not possible. We sometimes find tanks installed beneath the floor of the self-bailing cockpit or under the cabin transoms, placed thus to utilize space not otherwise valuable. Ocean racers, too, sometimes carry part of their fuel very low, since sufficient space could not otherwise be secured for their excessive fuel tankage. In all such cases the gasoline must be lifted to the carbureter by artificial means.

Sometimes in the larger craft a small pump is used and this, taking its power from some moving part of the motor, forces the fuel into an auxiliary feed tank of small capacity and elevated sufficiently to secure the required head. Again, the entire tank system is kept under pressure by means of an "exhaust pressure regulator," utilizing a minute portion of the spent gas from the motor's own exhaust for its operation. Such a system of pressure feed is probably the simpest and most reliable yet devised and therefore for marine purposes it is the best. Sufficient pressure may also be kept upon the tank by means of a small hand air pump similar to the ordinary bicycle tire pump which may be piped to the tank, and a few strokes now and then will supply the very moderate amount of pressure required to do the work. In small craft this will answer every purpose. The pump may be secured to a bulkhead near the wheel, where it can be conveniently reached at any time by the helmsman. A simple ball check is often installed in the fuel pipe between tank and carbureter to prevent back flow from the float chamber when the tank pressure is low. Of course the penalty of allowing the pressure to fall too low is the stopping of the motor. Therefore, for craft of any considerable size the exhaust pressure device is to be preferred since it is automatic in its action and operates as long as the motor is running. The hand pump, however, is even then necessary as an emergency device and for use in starting, and must be installed in any case, whether using the exhaust pressure regulator or not.

The tanks and piping in a pressure system must be air tight, no vent being possible as in the gravity system, since the pressure would cause an overflow through any opening. Should it be desired to install more than one tank and at times cut out one or more of them,



Mr. Horenburger employs a pump driven by the motor and a small auxiliary tank.

An Automatic System.

IN supplying fuel or gasoline from one or more main tanks to the carbureter when the gravity system is not practical, there are, of course, various devises to resort to. Pressure systems will instantly come to one's mind. Of the different pressure systems the air pressure will be found, in some cases, to be troublesome and unreliable, because all intakes, valves and so forth will have to withstand the air pressure. Therefore I will describe a system in which the gasoline supply is furnished by means of a pump.

The Prize Contest

The Auxiliary Tank and Power Pump.

IN THE system described below no pressure is used either in main or auxiliary tanks, thus reducing the danger of leaks. Also there is no pressure on the carbureter, the feed being by gravity from auxiliary tank. The auxiliary tank can be very small if a power pump is used and the main tanks need have no bottom openings.

It is not a good plan to force the fuel by air pressure or otherwise directly to carbureter, for the ordinary carbureters are not made to stand much pressure and may either flood the engine or leak. This system is entirely automatic if a fuel pump can be obtained and attached to the engine or propeller shaft. This could be either a plunger or rotary pump, but should be made especially for pumping gasoline or whatever is used for fuel. It should be ascertained just how much fuel per hour the engine uses and the pump should be of such a size as to supply a little in excess of this amount.

The diagram will show the piping arrangement; the piping, of course, is not drawn to scale, but merely shows the scheme. The gasoline is drawn from the main tank or tanks to the pump and then to the auxiliary tank, which should be at least a foot and a half above carbureter. When the auxiliary tank is full it will overflow into the main tank and will require no attention and will always be full; when the engine stops, the overflow stops, but the tank is left full for starting again. The valve at carbureter should be shut off when stopping the engine. A couple of strainers and water separators are shown, the larger the better. It would be well to have an indicator on the auxiliary tank to show the amount of fuel in it, especially if a hand pump is used as described later. Be sure and put no valves on the overflow line, for if the overflow was shut off the pressure would break something.

There must be an air vent in the main tank. The outlet pipe in main tank could enter at the top and extend down nearly to the bottom of the tank; if this is done the main tank need have no openings whatever in the bottom. If more than one main fuel tank is used they should be arranged with a tee connection with a shut-off valve at each tank, so that either or both can be used or either or both shut off.

For a small boat, or where the power fuel pump cannot be used, a hand pump for the fuel can be used, but in this case the auxiliary tank should have sufficient capacity for at least two hours running, otherwise the tank must be continually pumped full.

An indicator for the auxiliary tank is in this case almost a necessity, and if possible it should be located near the bulkhead or where it can be easily read. There would be no danger of getting the tank too full for it would simply overflow into the main tank as when the power pump was used.

H. H. PARKER, Oakland, Cal.

* * *

Utilizing Exhaust Pressure.

THE selection of the best method of supplying gasoline to the carbureter when the gravity system is not feasible is rather a difficult problem. There are several good practical systems in use, all having their advantages and disadvantages. These systems may be divided into two general classes: those using a pressure-feed, and those using a combination of the gravity and pressure feed. The selection of either of these classes and any particular system in that class is merely a matter of personal choice.

One pressure-feed system for use upon a two-cycle engine consists of: First, a small check valve connected to the crank case; second, a line of tubing connecting this valve with the top of the gasoline tank, and third, another line of pipe leading the fuel from the bottom of the tank directly to the carbureter. This system has the disadvantage of creating a pressure over the fuel nearly equal to that in the crank case, whereas for ordinary purposes a pressure of one or two pounds is ample, the pressure depending upon the depth of the tank below the carbureter. Another disadvantage is that of allowing lubricating oil to be carried from the crank case to the gasoline tank. However, the first objection may be overcome by placing a regulating spring in back of the check, and the second is not very serious, as most two-cycle engines are now oiled entirely through the gasoline.

Another system relies upon a small air pump to pump air to the gasoline tank, in order to force it to the carbureter. This pump is generally driven directly from the cam shaft, but there are several in use, having the cylinder of the pump screwed directly to the housing of the engine, and having the plunger fastened to one of the valve stem rods. This system not only requires a check valve between the pump and the tank, but it also requires a small relief valve to keep the pressure from becoming excessive.

Still another system uses what is known as an exhaust pressure regulator in place of the pump. The inlet of this regulator is connected directly to the exhaust, the outlet being connected to the top of the gasoline tank, while the fuel is led directly from the bottom of the tank to the carbureter.

With the system described above, a small hand pump with suitable piping must be used. This affords a means for supplying pressure to the fuel for starting up and for assisting the regular pressure system in case more pressure is needed.

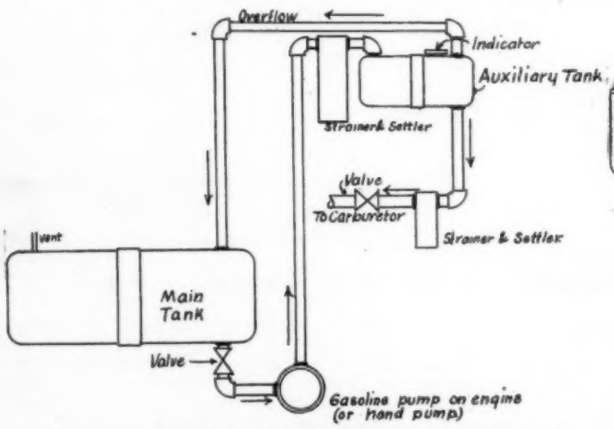
A combination system consists of a main gasoline tank, to which pressure is supplied by any of the methods described above. The gasoline is forced from this tank to an auxiliary tank, from which the gasoline is fed by gravity to the carbureter. A float valve placed in the auxiliary tank automatically regulates the supply of gasoline to it. The advantage of this system is that it does not require a hand pump for starting up.

Another combination system depends upon an ordinary suction pump to pump the fuel from one or more main tanks to a gravity tank. A pipe running from the gravity tank back to the main tanks takes care of the overflow. This pump works continuously and keeps up a constant circulation from the main tanks to the gravity tank, always maintaining a constant head on the carbureter. As this system does not have any of the disadvantages of the pressure system, it would be ideal if it were not for the fact that the fuel pipes must, on account of the pumps, be brought near the engine, causing danger of fire.

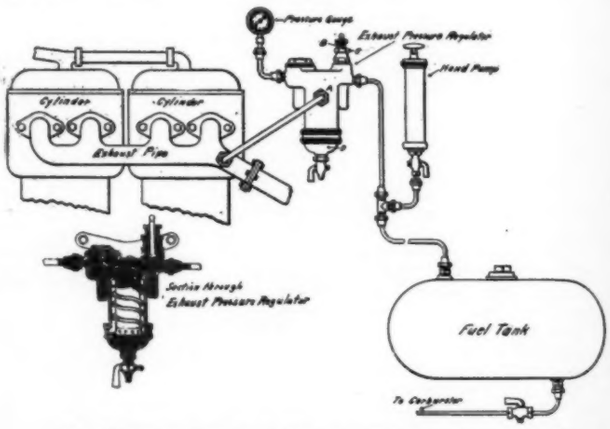
The exhaust regulator system, which has been chosen for a description in detail in this article, has been chosen not because it is necessarily the best system, but because, first, it is the one generally used; and, second, it is very easy to install, and when once installed it is absolutely foolproof and requires very little attention. There are no moving parts to be kept lubricated and all that is required is a little cleaning now and then. Of course there is slight danger of getting water in the gasoline from the exhaust, and of valves carbonizing, and of springs losing their temper, but, by judicious care and frequent inspection, no trouble whatever need be encountered.

The general layout for this system is shown by the accompanying sketch, there being several good makes of regulators upon the market. Part of the exhaust gas passes from the exhaust chamber through a tube, entering the regulator at A; it then passes around a spiral passage and thence through a number of small holes into a strainer chamber, thence through a fine gauze strainer, past a check valve into a passage which has two outlets.

ROBT. H. KREWSON, Philadelphia, Pa.



Mr. Parker's fuel line with main and auxiliary tanks, pump, strainer and gasoline indicator.



Mr. Krewson uses an exhaust pressure regulator with the pressure taken from the exhaust pipe.

The Polar Diesel.

The Motor that Drove Captain Amundsen's Fram to the Antarctic on His Successful Journey to the Pole. A Brief Description of It's Operation.

By J. Rendell Wilson.

So many successful motors of the Diesel type are now being built abroad that the selection of any particular one for description has become a difficult task. The leading claim to distinction of the Polar motor is that it drove Capt. Amundsen's famous Fram to the Antarctic on his successful journey to the South Pole. For this reason and because of its many interesting features, we have had Mr. Wilson prepare a description of it.—Editor.

ALTHOUGH about fifty great engineering firms are now engaged with the construction of engines of the Diesel-type, it must not be thought that all Diesels are alike in design; in fact, the variety of designs is remarkable, but, of course, the system of combustion by heat generated by high compression applies to all classes. The term "Polar" was given to this engine by the makers, the Aktiebolaget Diesels Motorer, of Stockholm, some years ago, and, curiously enough, four vessels fitted with Polar-Diesel engines have lately been engaged in service in the Polar regions, the most notable of these being Amundsen's "Fram."

The illustration is of the largest and most recent engine built by this Swedish concern, under K. J. E. Hesselman's patents. Apparently, there are six cylinders, but, in reality, only the after four are used for power developing, and are termed working-cylinders, the forward two forming scavenging pumps, air-compressors, and maneuvering-cylinders. The working-cylinders have a bore of 360 mm. (14 ins.) by 530 mm. (21 ins.) stroke, and 400 b.h.p. is developed at 205 revs. per minute on the two-stroke, single-acting, principle, and the engine is direct reversible. The weight of the engine, compressors, and pumps complete, is 30 tons, or 168 lbs. per b.h.p., while the fuel consumption is 200 grams (7 ounces) per b.h.p. per hour; that is to say, a consumption of 175 lbs. per hour for the 400 b.h.p. at full speed. Were the ship destined for American waters the fuel bill for a 24-hour day would be under $13, taking the cost of fuel at three cents per gallon. Doubtless, everyone will agree that this a wonderfully low figure for machinery of 400 b.h.p.

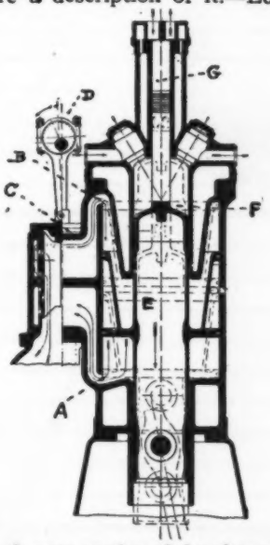
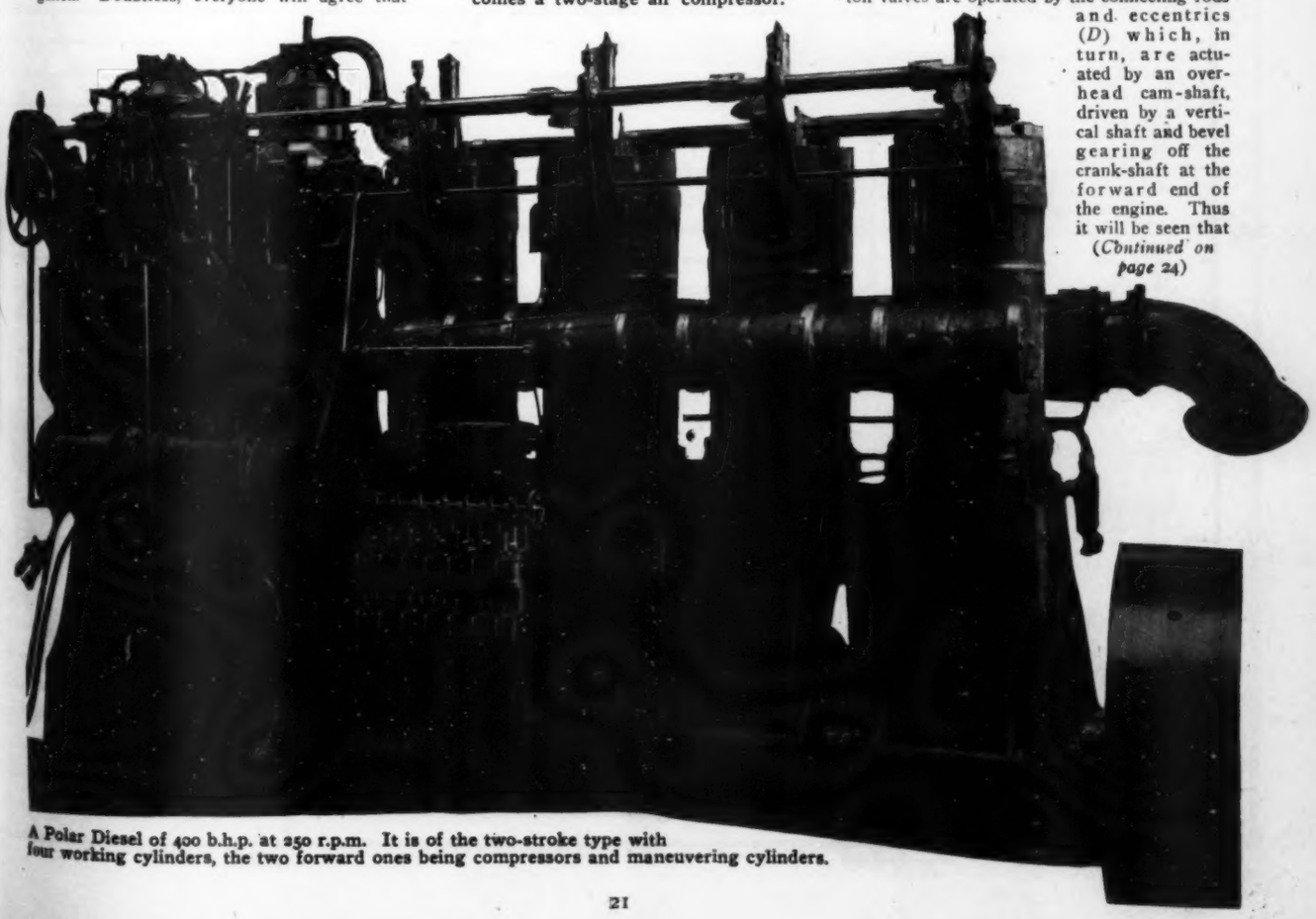


Fig. 1.—A cross section of the after maneuvering cylinder. It acts as an air engine in starting and when the motor is running, becomes a two-stage air compressor.

Let us now turn our attention to the two maneuvering-cylinders and their respective duties. Both of these cylinders are double-acting, and their cranks are set at 90 degrees, as are the cranks of the working-cylinders, so that perfect balance is maintained, and a start can be made on air with the cranks in any position. For starting purposes, they are used as air engines, obtaining their supply of air from a reservoir. Particular note should be taken of the after maneuvering-cylinder (Fig. 1) which is doubly stepped, the pistons (*F*) and (*G*) forming a two-stage air compressor for fuel injection. The compressor (*G*) accepts air already compressed by the compressor (*F*), via a cooler, and re-compresses it to 50-60 atmospheres (735-882 lbs. per square inch). When the engine is running on fuel, the double-acting piston (*E*), shown by dotted lines, becomes a pump and supplies scavenging air to the four working-cylinders at 0.2 atmospheres (5 lbs. per square inch). In the case of the forward of the two maneuvering-cylinders, which also contains a double-acting scavenging pump, the piston is singly stepped, the upper section forming a compressor for supplying a reservoir with air at 150 lbs. per square inch for starting and reversing purposes.

From the double-acting pumps (*E*), one in each maneuvering-cylinder, the air passes out at (*A*) and (*B*) to the ports in the working-cylinders, the supply being controlled by a piston valve (*C*), one being mounted on the port side of each maneuvering-cylinder. These piston valves are operated by the connecting rods and eccentrics (*D*) which, in turn, are actuated by an overhead cam-shaft, driven by a vertical shaft and bevel gearing off the crank-shaft at the forward end of the engine. Thus it will be seen that

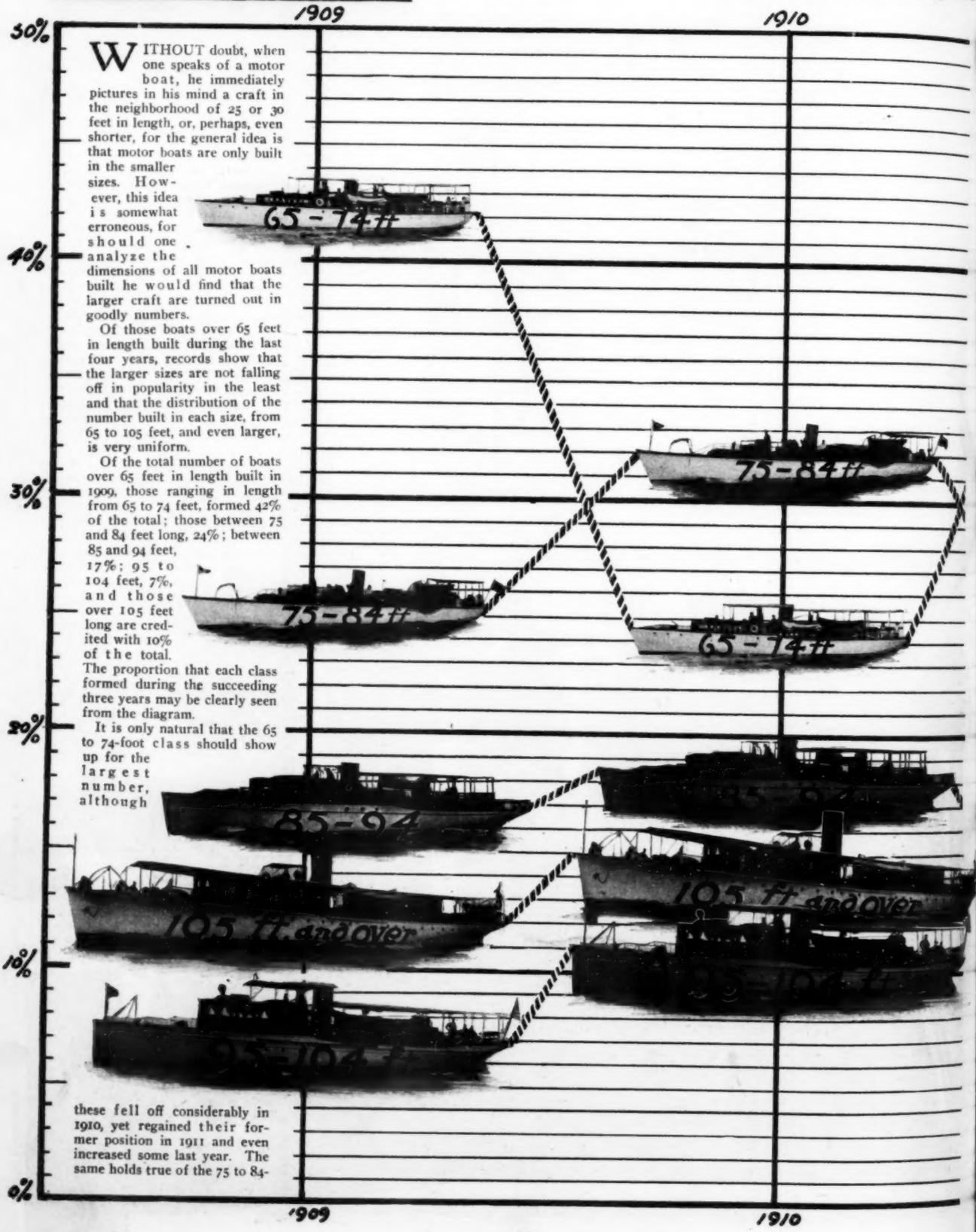
(*Continued on page 24*)



A Polar Diesel of 400 b.h.p. at 250 r.p.m. It is of the two-stroke type with four working cylinders, the two forward ones being compressors and maneuvering cylinders.

Are American Motor

An Analysis of the Sizes of Motor Yachts Over Yards During the Last Four Years, and Building During this



WITHOUT doubt, when one speaks of a motor boat, he immediately pictures in his mind a craft in the neighborhood of 25 or 30 feet in length, or, perhaps, even shorter, for the general idea is that motor boats are only built in the smaller sizes. However, this idea is somewhat erroneous, for should one analyze the dimensions of all motor boats built he would find that the larger craft are turned out in goodly numbers.

Of those boats over 65 feet in length built during the last four years, records show that the larger sizes are not falling off in popularity in the least and that the distribution of the number built in each size, from 65 to 105 feet, and even larger, is very uniform.

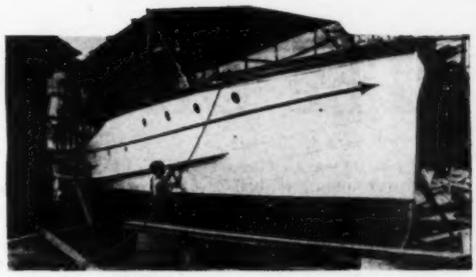
Of the total number of boats over 65 feet in length built in 1909, those ranging in length from 65 to 74 feet, formed 42% of the total; those between 75 and 84 feet long, 24%; between 85 and 94 feet, 17%; 95 to 104 feet, 7%, and those over 105 feet long are credited with 10% of the total. The proportion that each class formed during the succeeding three years may be clearly seen from the diagram.

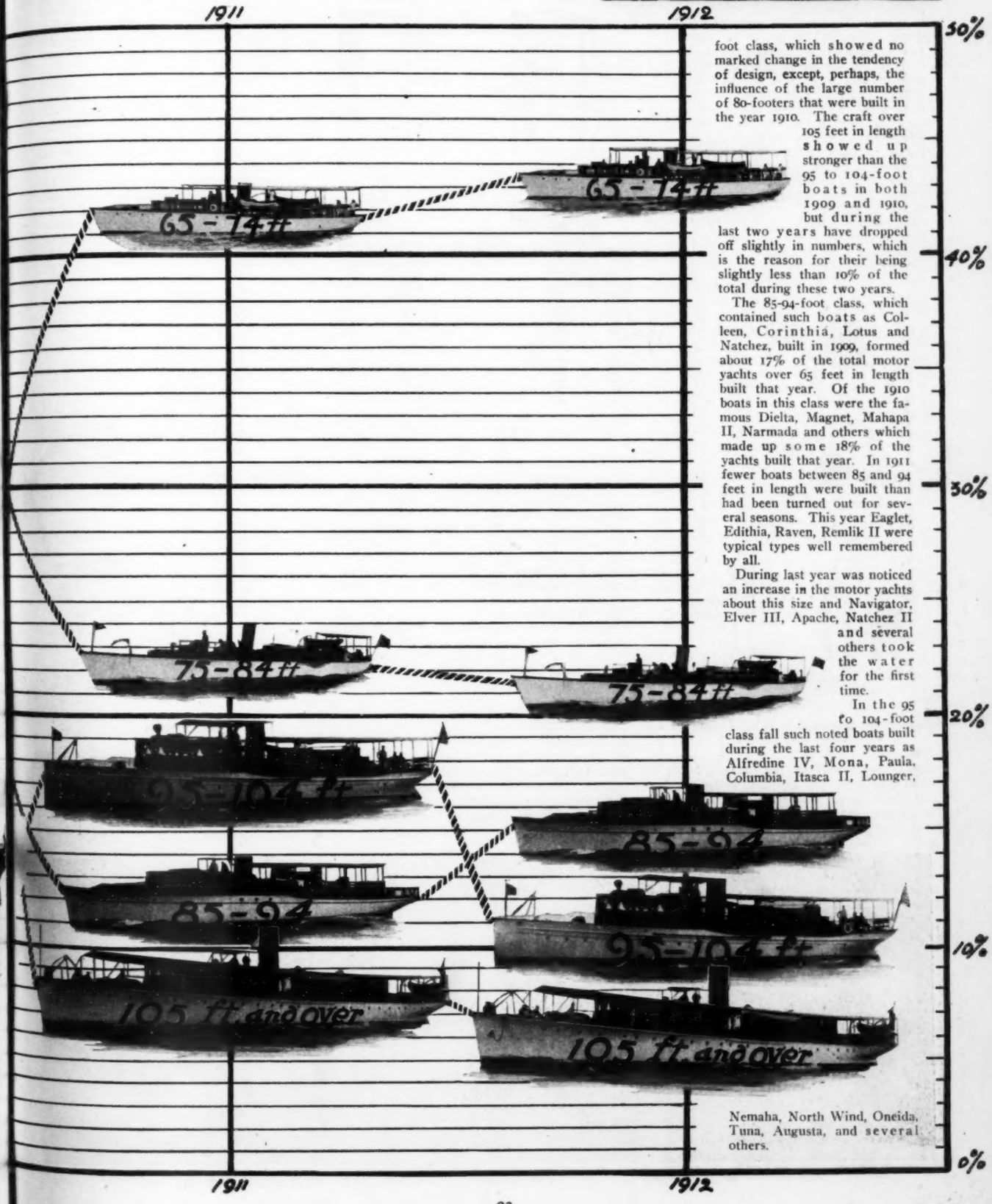
It is only natural that the 65 to 74-foot class should show up for the largest number, although these fell off considerably in 1910, yet regained their former position in 1911 and even increased some last year. The same holds true of the 75 to 84-

Yachts Getting Bigger?

Sixty-five Feet in Length Built in the American Period Shown Graphically.

The Progress and Trend of Design





foot class, which showed no marked change in the tendency of design, except, perhaps, the influence of the large number of 80-footers that were built in the year 1910. The craft over 105 feet in length showed up stronger than the 95 to 104-foot boats in both 1909 and 1910, but during the last two years have dropped off slightly in numbers, which is the reason for their being slightly less than 10% of the total during these two years.

The 85-94-foot class, which contained such boats as Colleen, Corinthia, Lotus and Natchez, built in 1909, formed about 17% of the total motor yachts over 65 feet in length built that year. Of the 1910 boats in this class were the famous Dielta, Magnet, Mahapa II, Narmada and others which made up some 18% of the yachts built that year. In 1911 fewer boats between 85 and 94 feet in length were built than had been turned out for several seasons. This year Eaglet, Edithia, Raven, Remlik II were typical types well remembered by all.

During last year was noticed an increase in the motor yachts about this size and Navigator, Elver III, Apache, Natchez II and several others took the water for the first time.

In the 95 to 104-foot class fall such noted boats built during the last four years as Alfredine IV, Mona, Paula, Columbia, Itasca II, Lounger, Nemaha, North Wind, Oneida, Tuna, Augusta, and several others.

The Diesel of Amundsen's Fram.

(*Continued from page 21*)

four scavenging air-blasts are obtained every revolution, which gives a very efficient supply to the four working-cylinders and clears out all burned gases.

When it is necessary to start the engine, the two double-acting scavenging pistons (*E*) are temporarily utilized as air engines, air being admitted (by the piston valves (*C*) from the air reservoir through a reducing valve) to whichever side of the piston that happens to be in the correct position; that is to say, either at (*A*) or (*B*). The air reservoir, as before mentioned, is charged by the compressor in the forward cylinder. Should the air in the reservoir fall below a certain figure, the compressor operates until the correct pressure is attained when a relief valve comes into action. For reversing, air is admitted in the same manner. A couple of revolutions on air is generally sufficient for the four working-cylinders to pick up the load, either when starting or reversing.

Several advantages are gained by the Hesselman system, one being that excessive valve gear on the cylinder heads is dispensed with, the only one being the fuel injection valve. Another point is that the working-cylinder castings are not subject to the strains and stresses caused by changes in temperature through suddenly admitting cool air to the hot working-cylinders when reversing. It may be argued that too much mechanical efficiency is absorbed by the two maneuvering-cylinders, which are always running; but this is not so, as they are continually giving valuable work, and it is necessary for an engine of the two-stroke Diesel-type to have a three-stage air compressor constantly in action. This must absorb a certain amount of power; with big engines, however, auxiliary power is usually provided for this purpose. With the Polar engine, the power absorbed by cams and rockers is greatly reduced.

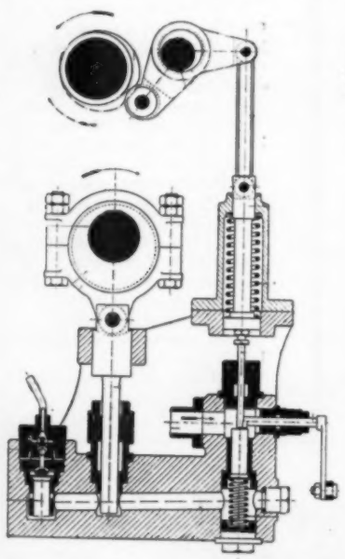


Fig. 3.—A sectional drawing of one of the four fuel pumps.

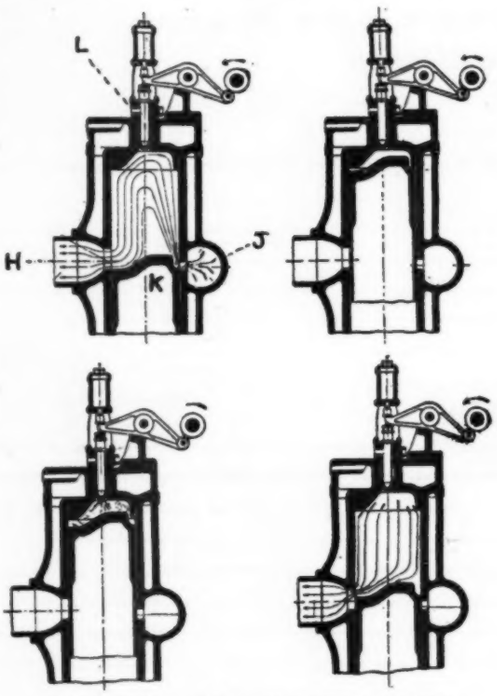


Fig. 2, a, b, c and d. Diagramatic sections of a working cylinder at different periods of the cycle.

Turning again to the working-cylinders, Figs. 2*a*, 2*b*, 2*c* and 2*d* show a section of one of these; it will be seen that the piston-head (*K*) is specially shaped in order that the exhaust ports (*H*) are opened, on the down stroke, some little time before the scavenging ports (*J*), so that the exhaust gases may pass out and the pressure become reduced before the admittance of scavenging air; whilst on the up-stroke, the scavenger ports are closed before the exhaust ports. The fuel injection valve is shown at (*L*). Fig. 2*a* shows the scavenging action and the filling of the cylinder with pure air, while Fig. 2*b* illustrates the piston compressing the air to 526 lbs. per square inch, generating, of course, an enormous heat. Fig. 2*c* shows the fuel being injected by air-blast at about 800 lbs. per square inch, combustion being instantaneous, and Fig. 2*d* depicts the exhaust gases passing out just before the opening of the scavenging port.

For each cylinder there is a separate fuel pump, which supplies at each stroke of the plunger the correct quantity of fuel to be injected. Fig. 3 shows a section of one of the fuel pumps. The operation is by rockers and links from the engine cam-shaft, and the links are pivoted eccentrically on a spindle, which can be turned by hand, when desired, thus altering their position relative to the cam, and so varying the opening of the suction valves. This action controls the supply of fuel that is forced to the injection valve. For reversing, the cam-shaft is moved fore and aft, bringing fresh sets of cams into action for both the injection valves and the pump-link rockers.

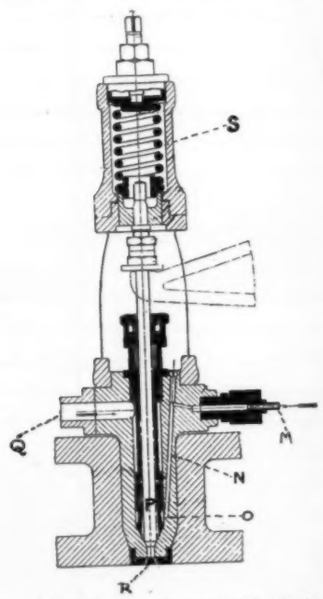


Fig. 4.—Cross section of one of the fuel injection valves.

The fuel injection valves are of great interest and Fig. 4 depicts a section of one of these.

The new steel life barge of the Welin Marine Equipment Company, showing its almost unlimited carrying capacity.

NEW MOTOR BOAT DESIGNS

A High-Speed Cruiser.

A 60-Footer for Day Service, with a Speed of 20 Miles an Hour.

THE plans below are of the 60-ft. high-speed cruiser designed by Mr. Wm. Edgar John, of Philadelphia, for Mr. R. P. Smith, of the Keystone Yacht Club, who will use the boat when completed on the Delaware River and Bay. The problem in laying out the craft was to obtain the low rakish appearance of the torpedo boat type, consistent with her speed of 20 miles an hour, and at the same time to obtain substantial construction. The hull, in fact, is rather heavily built for a fast boat, the frames being of oak 1½" x 1⅞" planked with 1⅛" light cedar. The keel is of white oak, sided 6 inches and there is a heavy keelson running the entire length of the boat over the floors.

The usual chain locker is in the fore peak and is accessible through a deck plate forward. Next aft is the crew's toilet room, followed by the forecastle with two transoms and two pipe berths. There is a sunken pilot house for the use of the helmsman in bad weather and the space beneath this is occupied by water and gasoline tanks, lockers, etc. Beneath the bridge are the galley to starboard and the toilet room to port. A trunk extends from the bridge over the main saloon and continues aft as a narrower trunk over the engine room. The accommodations in the main cabin are sufficient to sleep several persons comfortably, although the boat is primarily for day service and no great amount of accommodation has been attempted.

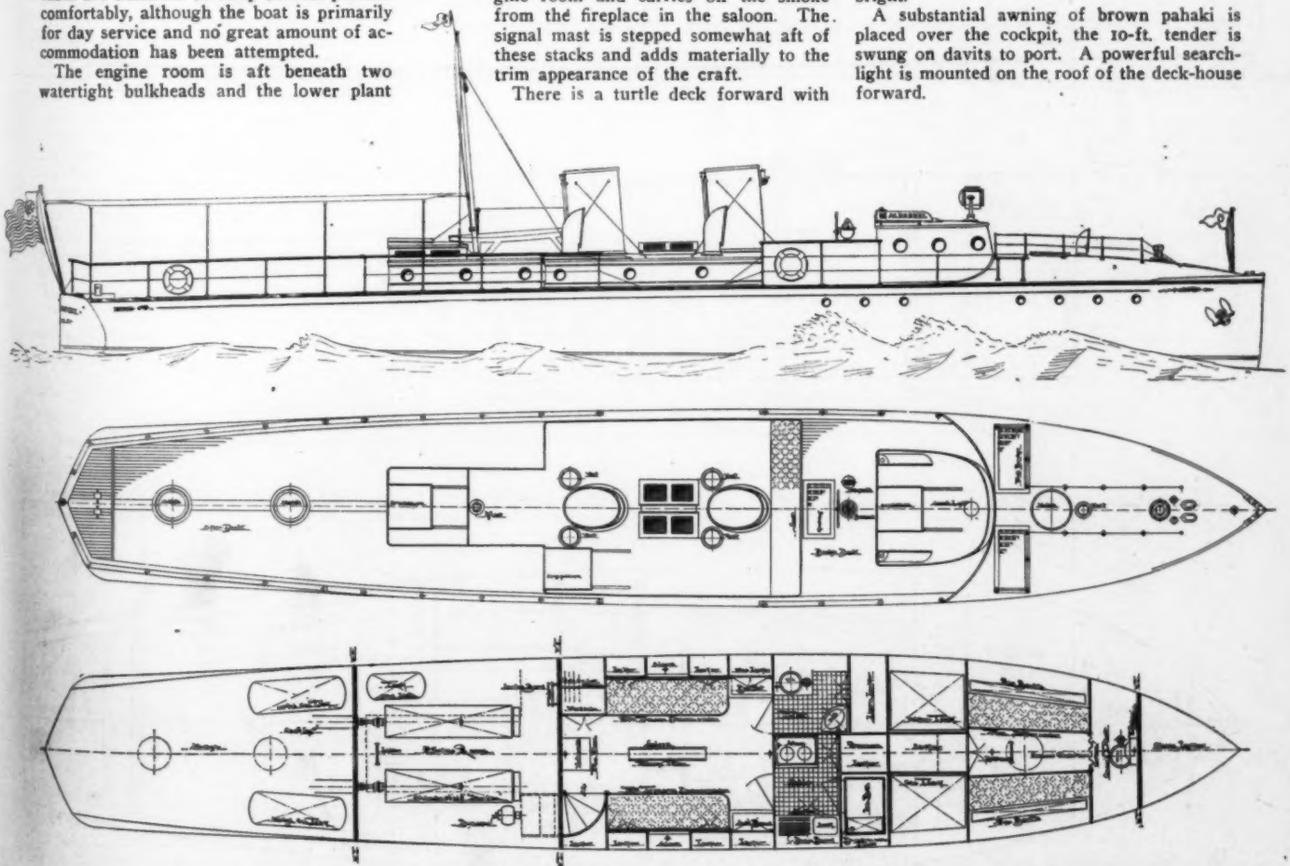
The engine room is aft beneath two watertight bulkheads and the lower plant consists of two 8 cylinder 5½" x 6¾" Sterling motors turning at 800 r.p.m. and while the contract only calls for 20 miles per hour, the designer expects that it will be possible to do 25 miles when necessary. The switch board is located on the forward bulkhead to port and to starboard is a dynamo belted to the engine. The engine compartment is accessible from the large cockpit through an after companionway, although there is no communication between it and the main saloon amidships. The cockpit is exceedingly roomy and is sunk only 12 inches below the sheer line, which keeps the awning low without interfering with the self-bailing properties. Under the cockpit floor on either side are 100 gallon seamless steel gasoline tanks and the rest of the space is available for storage, being accessible through two manholes in the cockpit floor.

The outboard profile shows two stacks, the forward one of which ventilates the saloon and carries a whistle tank and the stack from the galley. The after stack ventilates the engine room and carries off the smoke from the fireplace in the saloon. The signal mast is stepped somewhat aft of these stacks and adds materially to the trim appearance of the craft.

There is a turtle deck forward with two bridge decks arranged on either side and provided with rails to protect the crew when working with lines forward. Two large anchors are carried in the hawsepipes. The bridge deck is just aft of the pilot house which protects the man at the wheel. On it are arranged the binnacle and engine telegraph, besides the steering gear and there is a comfortable seat across the forward end of the trunk. Special care is given to the matter of ventilation and all the ports are arranged to swing in. These, together with the five cowls and stacks, should accomplish the desired results.

As to interior finish, the crew's quarters are done in brown, the interior of the pilot house is in white enamel with mahogany trim and the galley floor and walls are tiled and finished in white enamel, as is also the toilet room. The main saloon is finished in paneled and carved mahogany with cushions, carpets and curtains of royal blue. All exterior work is of mahogany finished bright and the top sides of the hull are black with bright green bottom paint and a white boot top between. The pilot house is painted black, the forward deck and cabin top, ventilators and stacks being finished in navy buff. The side decks and cockpit floor are all of white pine finished bright.

A substantial awning of brown pahaki is placed over the cockpit, the 10-ft. tender is swung on davits to port. A powerful searchlight is mounted on the roof of the deck-house forward.



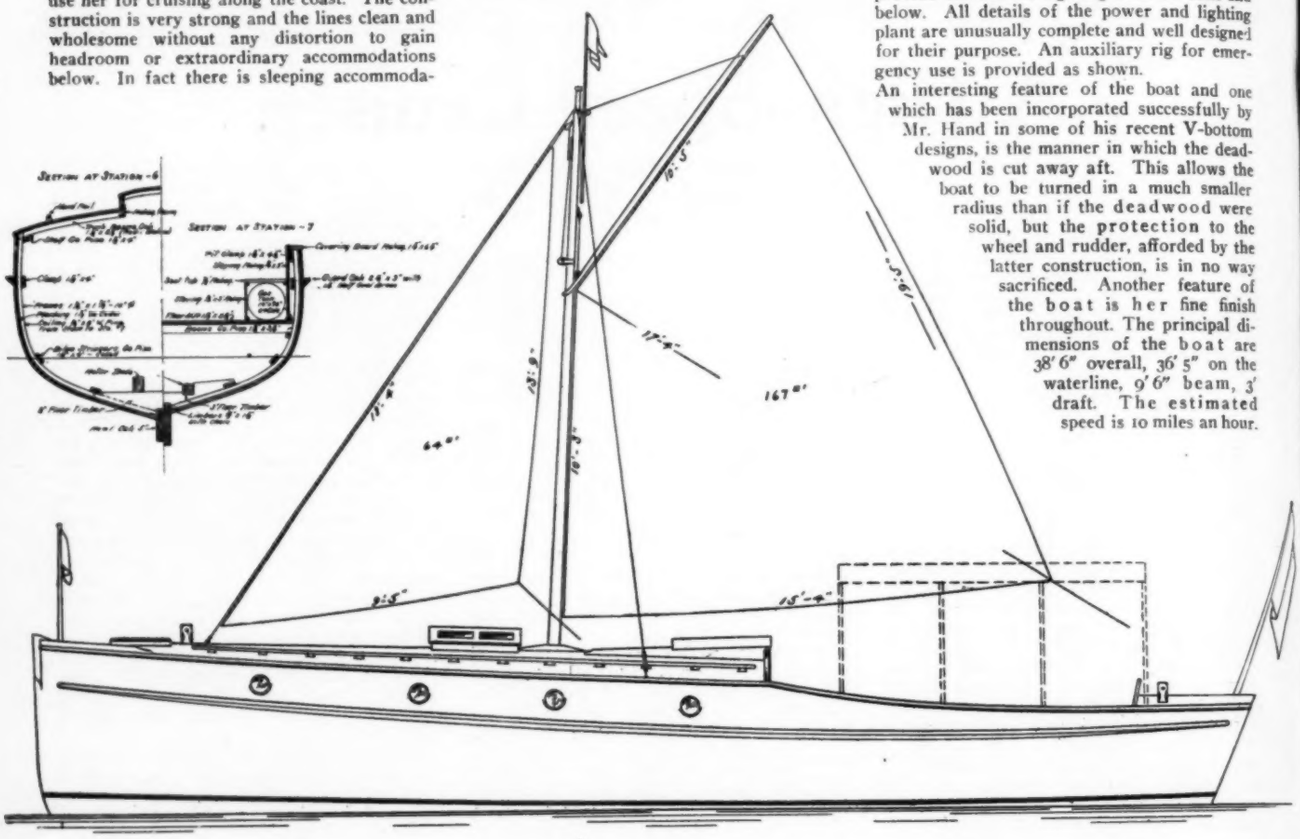
The fast 60-footer designed by W. E. John of Philadelphia for Mr. R. P. Smith of the Keystone Yacht Club.

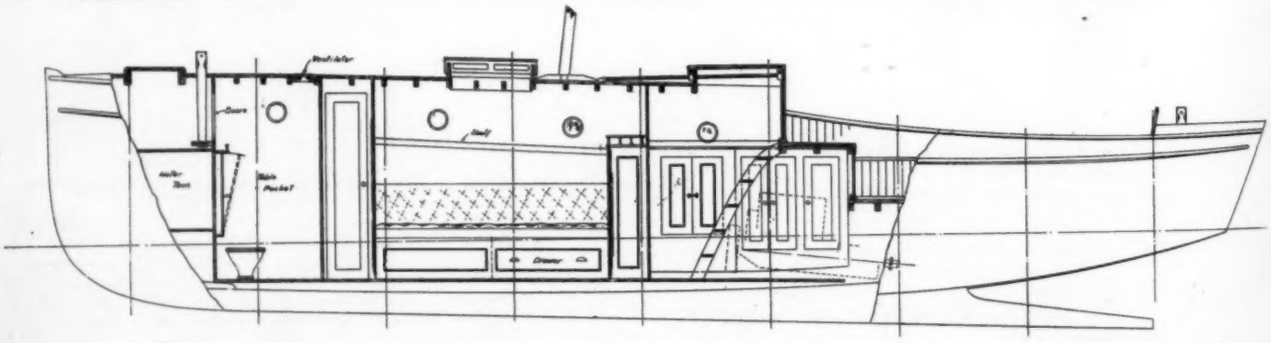
A Raised Deck 38-Footer.

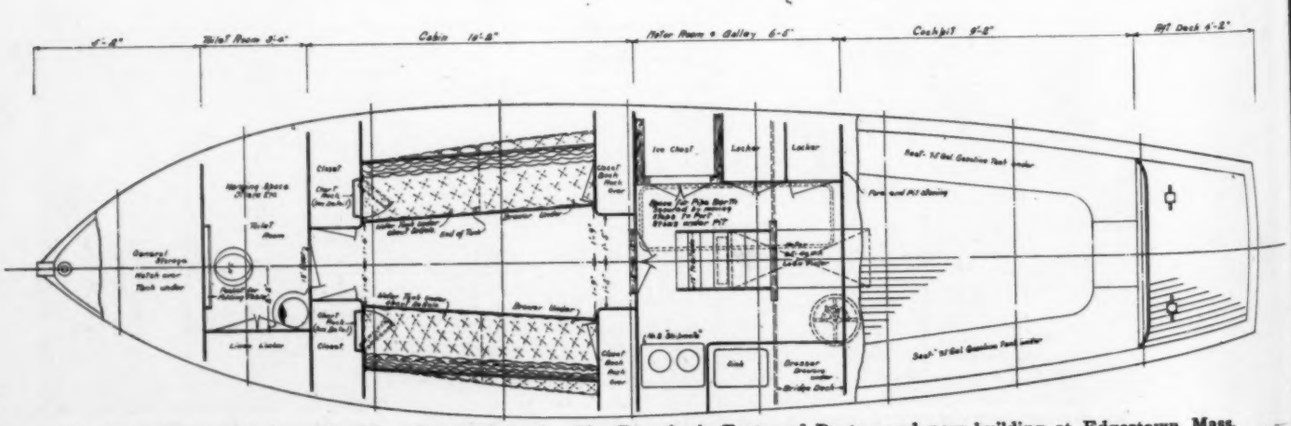
AT Edgertown, Mass., there is being built a 38-ft. raised deck cruiser from the design of Mr. Wm. H. Hand, Jr., of New Bedford, shown herewith. The new boat is for Mr. Francis A. Foster, of Boston, who will use her for cruising along the coast. The construction is very strong and the lines clean and wholesome without any distortion to gain headroom or extraordinary accommodations below. In fact there is sleeping accommodations for but two persons besides a berth for the man in the engine room, but these accommodations are excellent and the cockpit is amply proportioned so that a large party can be carried for day runs.

The motor is to be a 25 h.p. four cylinder Loew Victor installed under the bridge deck with all controls led to the wheel. An electric self-starting device will be fitted to the motor which in addition to starting the motor will provide current for lighting both on deck and below. All details of the power and lighting plant are unusually complete and well designed for their purpose. An auxiliary rig for emergency use is provided as shown.

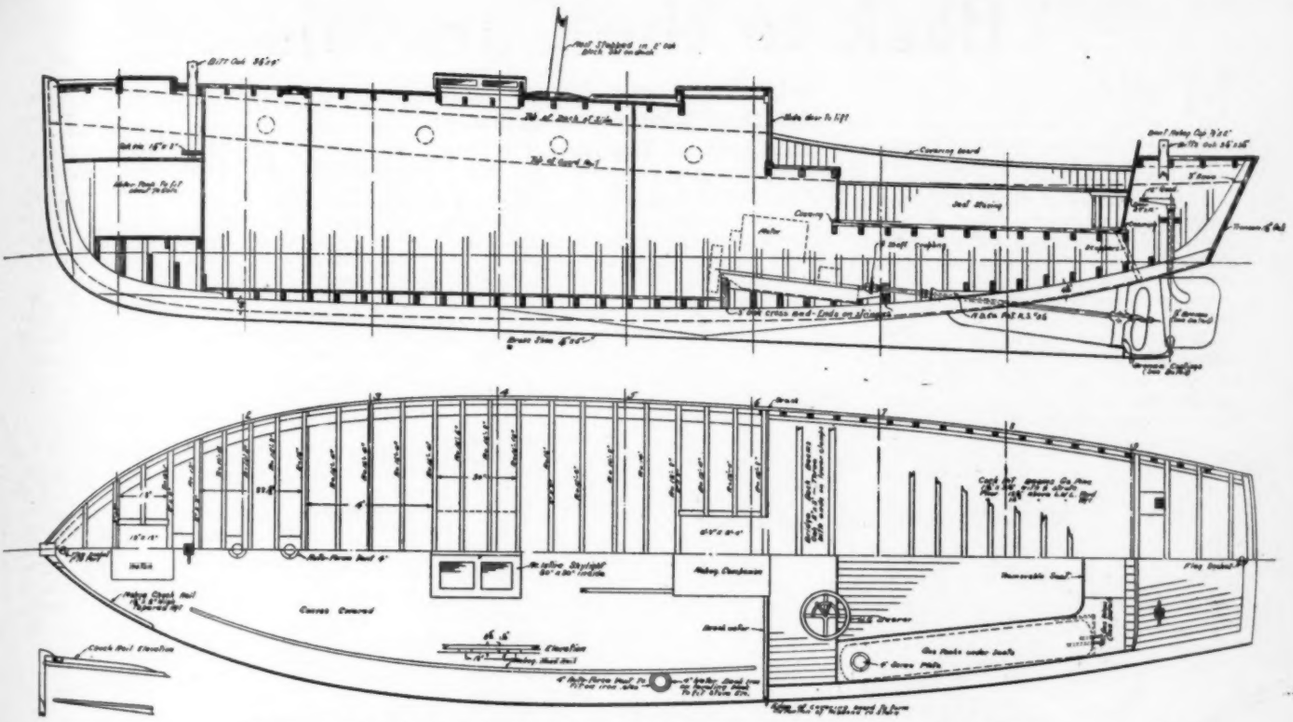
An interesting feature of the boat and one which has been incorporated successfully by Mr. Hand in some of his recent V-bottom designs, is the manner in which the deadwood is cut away aft. This allows the boat to be turned in a much smaller radius than if the deadwood were solid, but the protection to the wheel and rudder, afforded by the latter construction, is in no way sacrificed. Another feature of the boat is her fine finish throughout. The principal dimensions of the boat are 38' 6" overall, 36' 5" on the waterline, 9' 6" beam, 3' draft. The estimated speed is 10 miles an hour.







The trim 38 footer designed by Wm. H. Hand Jr. for Mr. Francis A. Foster of Boston and now building at Edgertown, Mass.



The construction plan and elevation of the Hand 38-footer described on the opposite page.

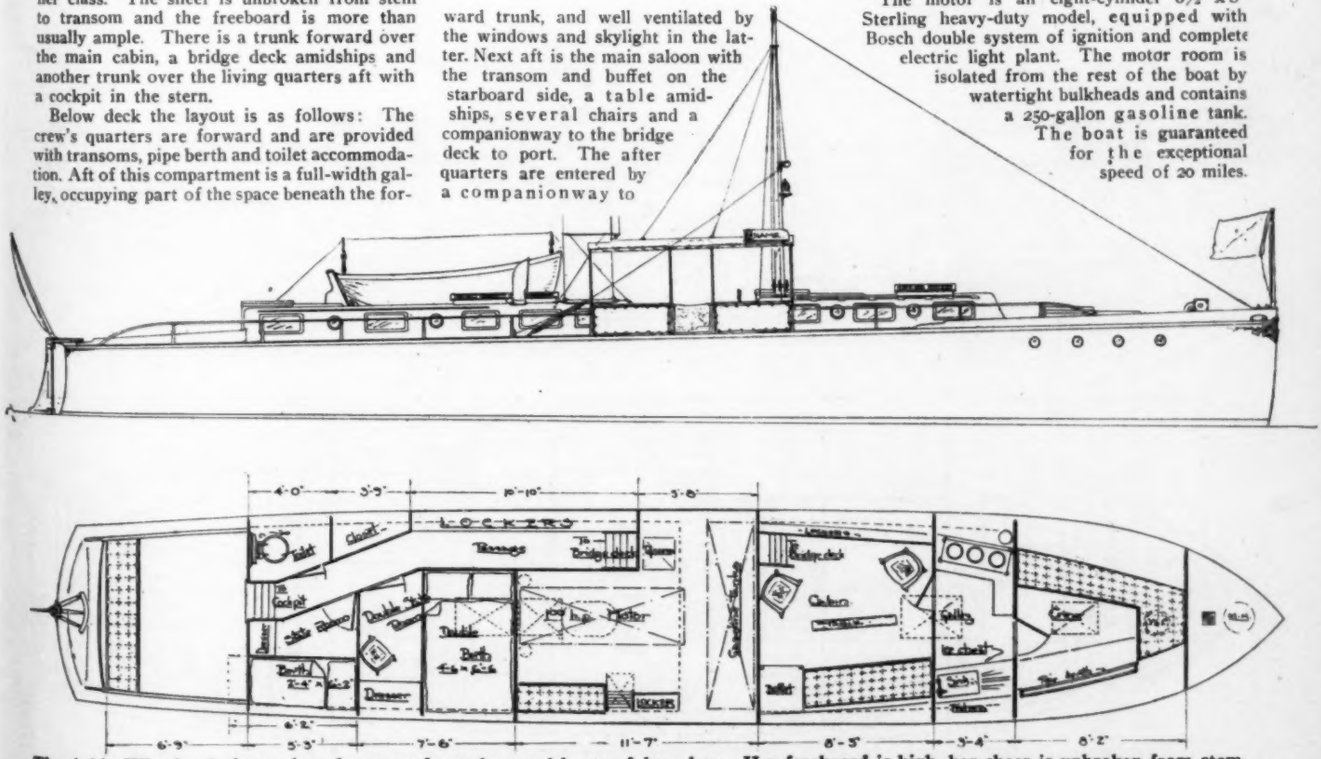
A 60 Footer of Novel Design.

Designed for Fast Cruising by the Atkin-Wheeler Company and Guaranteed for 20 Miles an Hour.

THE outboard profile and accommodation plan shown at the bottom of this page are from a recent design by Atkin-Wheeler Company, of Halesite, Huntington Harbor, L. I., for a resident of Huntington, and in many features it will be seen that she is radically different from the usual craft of her class. The sheer is unbroken from stem to transom and the freeboard is more than usually ample. There is a trunk forward over the main cabin, a bridge deck amidships and another trunk over the living quarters aft with a cockpit in the stern.

Below deck the layout is as follows: The crew's quarters are forward and are provided with transoms, pipe berth and toilet accommodation. Aft of this compartment is a full-width galley, occupying part of the space beneath the forward trunk, and well ventilated by the windows and skylight in the latter. Next aft is the main saloon with the transom and buffet on the starboard side, a table amidships, several chairs and a companionway to the bridge deck to port. The after quarters are entered by a companionway to port, which leads to a passage running clear to the cockpit. To the left of this passage are lockers, and to the right are the motor room amidships, a double stateroom aft of it and a single stateroom still farther aft. Opposite the latter are a toilet-room and a large hanging closet to port.

The motor is an eight-cylinder 6½" x 8" Sterling heavy-duty model, equipped with Bosch double system of ignition and complete electric light plant. The motor room is isolated from the rest of the boat by watertight bulkheads and contains a 250-gallon gasoline tank. The boat is guaranteed for the exceptional speed of 20 miles.



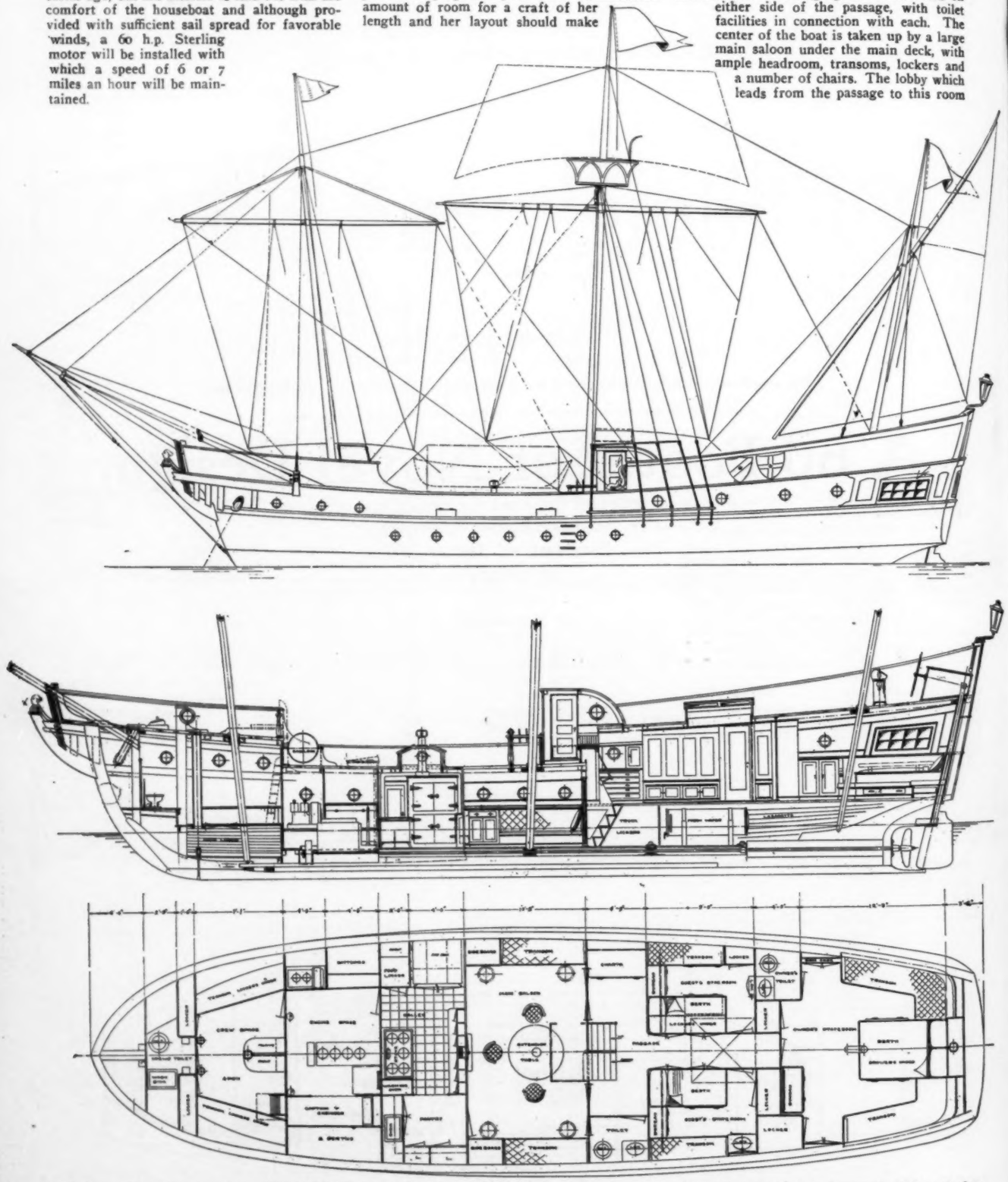
The Atkin-Wheeler 60-footer is a departure from the usual boats of her class. Her freeboard is high, her sheer is unbroken from stem to transom and there are trunks forward and aft with a cockpit in the stern. The interior layout is also unique.

Back to the Caravels.

A Unique Power House Boat Designed Along the Lines of the Craft of Columbus's Day.

MESSRS. SWASEY, RAYMOND & PAGE, of Boston, have recently turned out the interesting design on this page for Mr. Henry A. Morss, of Boston. In model, the new craft, which is being built by Messrs. Stearns & McKay, of Marblehead, is practically a replica of the craft of four centuries ago, but the interior is laid out with the comfort of the houseboat and although provided with sufficient sail spread for favorable winds, a 60 h.p. Sterling motor will be installed with which a speed of 6 or 7 miles an hour will be maintained.

While at first sight the boat looks like a peculiar proposition, she has a remarkable amount of room for a craft of her length and her layout should make her an attractive and comfortable craft to live on. By working out the high quarter deck as shown, carrying the sheer well up aft, the designers were enabled to obtain an excellent stateroom in the stern with exceptional light provided by the large windows at the sides and in the transom. Just forward of this there are two large guests' staterooms on either side of the passage, with toilet facilities in connection with each. The center of the boat is taken up by a large main saloon under the main deck, with ample headroom, transoms, lockers and a number of chairs. The lobby which leads from the passage to this room



Mr. Harry A. Morss's unique houseboat is practically a replica of the sturdy craft of four centuries ago, and is powered with a 60 h.p. Sterling engine.

is in easy communication with the deck above and is an excellent navigating room.

The galley and pantry occupy the space next forward and extend the full width of the boat. The motor room is forward of it with the stateroom for the captain and engineer to port, and the forecastle providing accommodation for four men forward.

The displacement of the boat is 65 tons, which is almost double that for the usual craft of her length, so that it is evident that she is sturdily built. The boat is now under construction at the yard of Messrs. Stearns & McKay and when completed will be sailed around the Cape to Long Island Sound.

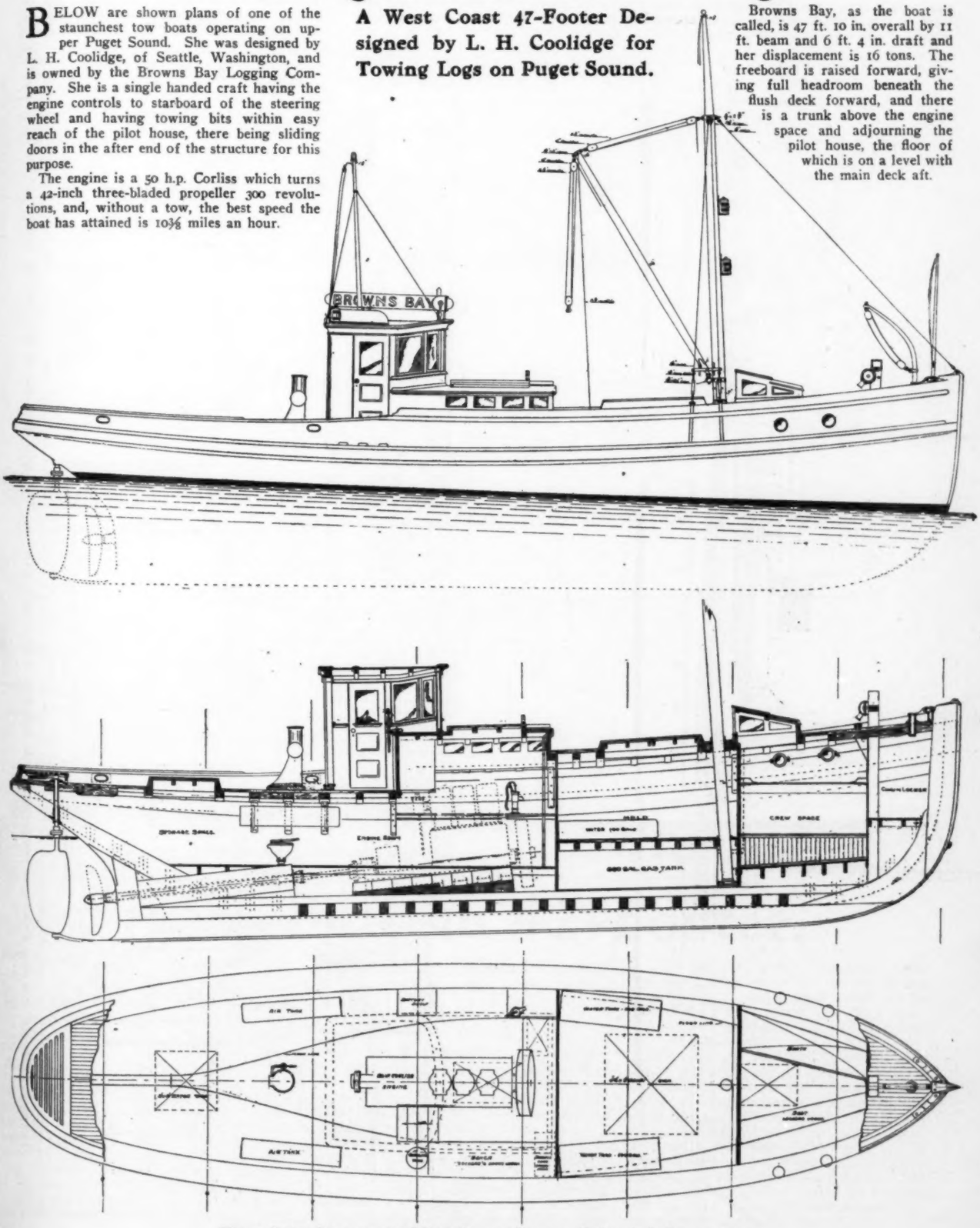
A Single Handed Tug.

A West Coast 47-Footer Designed by L. H. Coolidge for Towing Logs on Puget Sound.

BELOW are shown plans of one of the staunchest tow boats operating on upper Puget Sound. She was designed by L. H. Coolidge, of Seattle, Washington, and is owned by the Browns Bay Logging Company. She is a single handed craft having the engine controls to starboard of the steering wheel and having towing bits within easy reach of the pilot house, there being sliding doors in the after end of the structure for this purpose.

The engine is a 50 h.p. Corliss which turns a 42-inch three-bladed propeller 300 revolutions, and, without a tow, the best speed the boat has attained is 10⅜ miles an hour.

Browns Bay, as the boat is called, is 47 ft. 10 in. overall by 11 ft. beam and 6 ft. 4 in. draft and her displacement is 16 tons. The freeboard is raised forward, giving full headroom beneath the flush deck forward, and there is a trunk above the engine space and adjourning the pilot house, the floor of which is on a level with the main deck aft.



The 47-ft. tug is so arranged that she may be controlled entirely by one man.

A Deep Sea Motor Yacht.

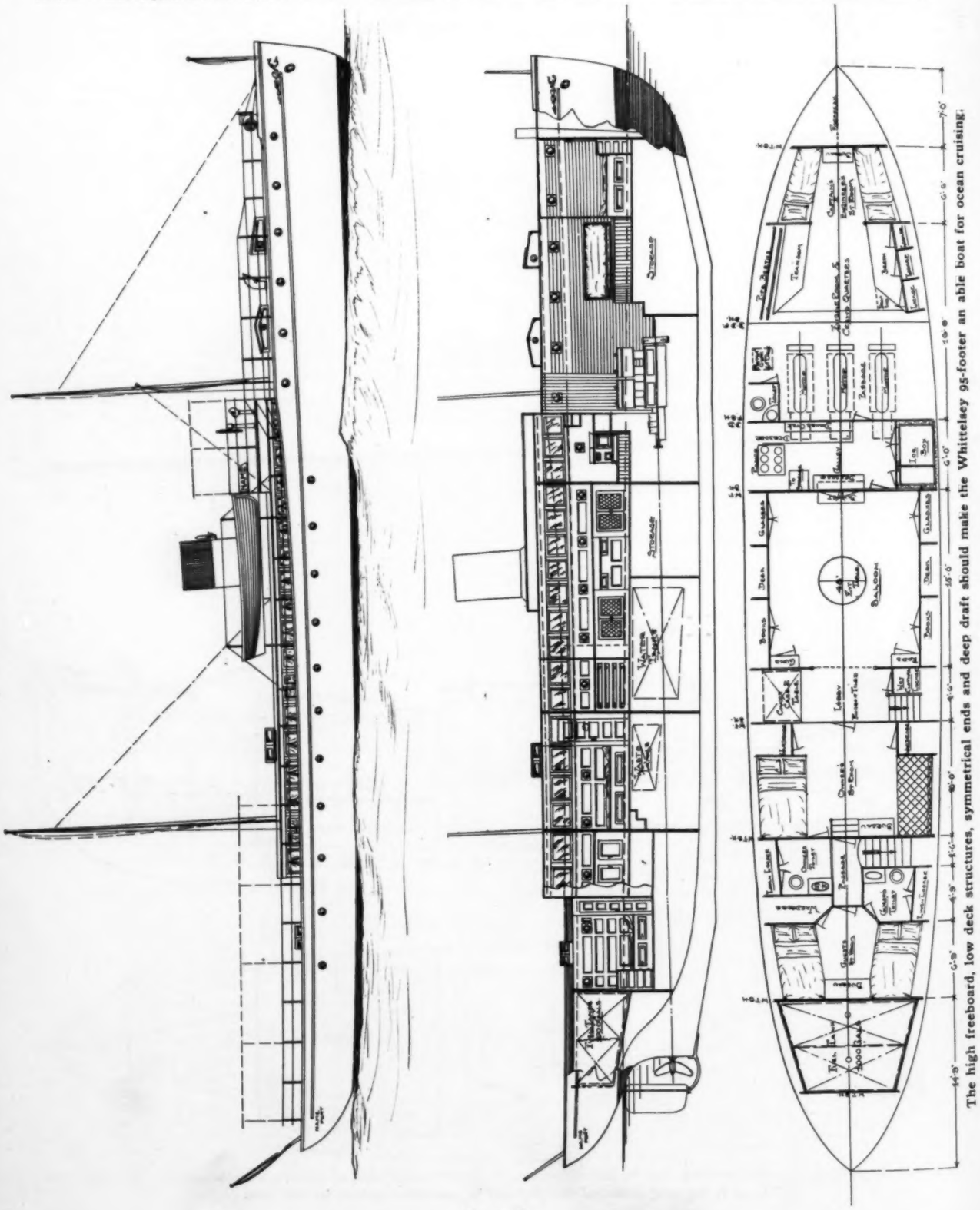
A 95-Footer Designed Primarily for Outside Work by Messrs. Whittelsey & Whittelsey.

THIS vessel has been especially designed by Messrs. Whittelsey & Whittelsey, of New York City, for heavy outside work. She is of the raised deck type with long low center house, care having been taken to protect this house from the sea and the design calls for ample freeboard and deep draft. The maximum is 8 ft. She is to be powered with three 65 h.p. gasoline motors driving triple screws. These engines are set very low in the vessel, owing to the depth of the hull. The water and gasoline are also carried low and of large capacity for extensive cruising.

The construction of the boat is to be of wood, extra heavy throughout and copper fastened. The rig is to consist of two stout masts carrying sufficient sail to steady the boat.

The interior layout consists of crew's quarters forward followed by gallery and engine room, main saloon and staterooms.

The boat is 95 ft. overall by 17 ft. beam and 8 ft. draft. Her form follows closely that of the 75 footer Edamena, well known as a remarkable sea boat of the deep bodied type.



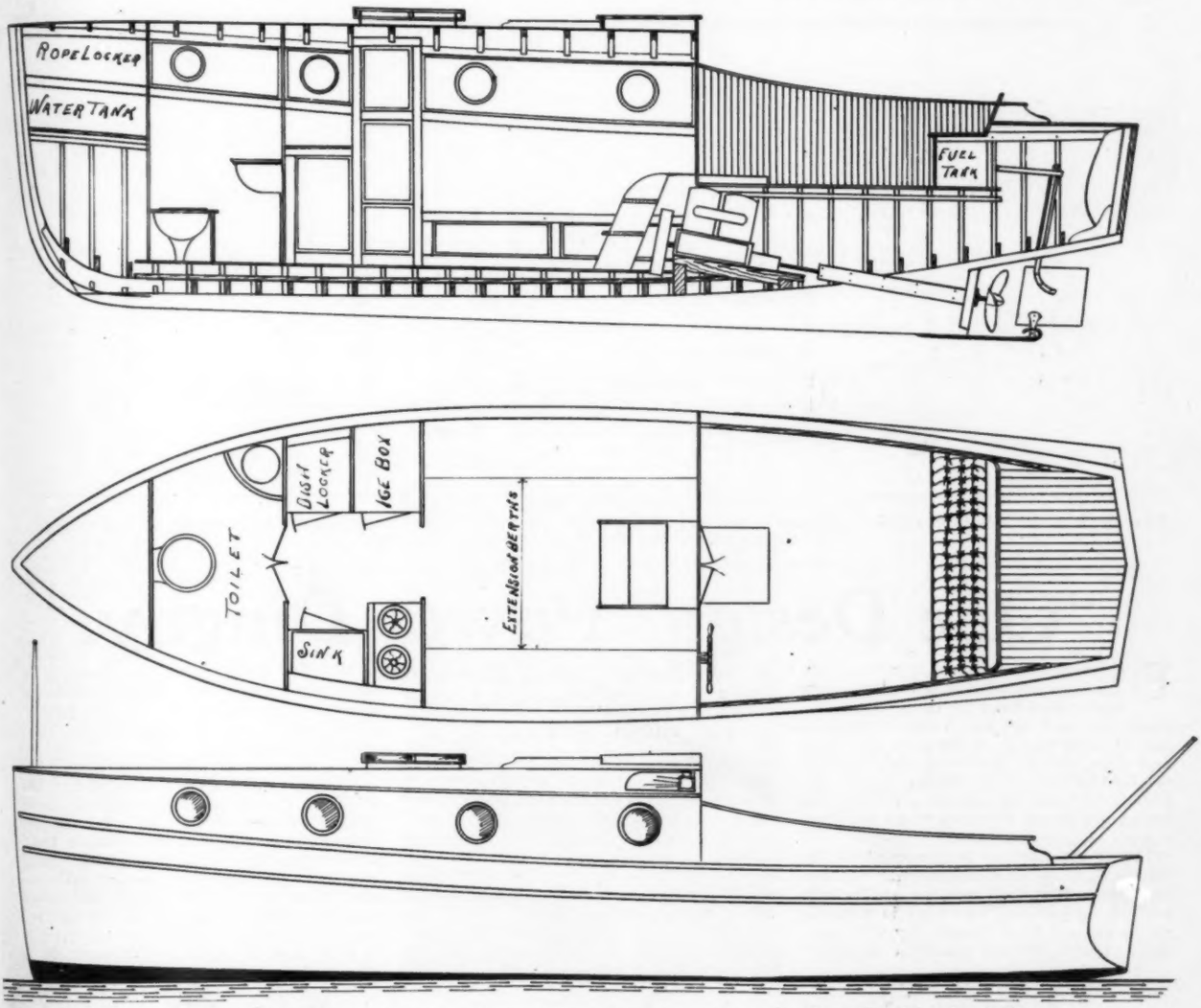
The high freeboard, low deck structures, symmetrical ends and deep draft should make the Whittelsey 95-footer an able boat for ocean cruising.

A Small Stock Cruiser.

THE little boat shown below is one of the latest models of the Pioneer Boat and Pattern Company, of Bay City, Mich. She is of the usual raised-deck type, with an interior arrangement that is somewhat different from the prevailing practice. Instead of the galley aft beside the engine, and the side companionway, the galley is forward between the toilet-room and the cabin, well ventilated by the sky-light and away from the engine. The companionway is arranged in the middle of the boat with the steps above the motor as in sailboat practice. The motor is easily accessible through a hatch in the cockpit floor and projects but a little way into the cabin.

The cockpit is large enough to accommodate several chairs and there is a lazy-back seat across the after end, under which the fuel tank is installed. There is an ample after deck, but the cockpit coaming has been carried practically out to the sides of the boat, eliminating the usual waterway and adding considerably to the width of the cockpit.

The dimensions are 26 feet overall, 7-feet beam and 2-ft. 6-in. draft and a 2-cylinder motor of 8 h.p. is installed. The boat may be had either complete or in knockdown form.



The galley of the Pioneer 26-footer is forward, away from the engine and well ventilated by the skylight.

A V-Bottom 42-Footer.

THE plans shown on the following page are of a 42-ft. V-bottom cruiser, which was designed and is being built by the Bayonne Launch Company, of Bayonne, N. J., for Mr. A. Hoffman, of New York City.

This is probably the largest V-bottom cruiser that has been built, to be used solely as a pleasure craft. The seaworthy qualities of the V-bottom, or as it has commonly been known, the "skipjack," are appreciated by those who have had experience with this type, but the principal drawback heretofore, has been its box-like appearance, owing to the straight sides which have generally been built in these boats. This detriment, however, has been overcome in the Doyle model V-bottom boats, the Bayonne Launch Company is building, and it will be noticed that the plans herewith contain just enough round in the side frames to give the boat the appearance of a round-bottom cruiser. Above the waterline, the appearance is almost the same as the typical round-bottom double-cabin cruiser, but below the waterline the regulation V sections have been used.

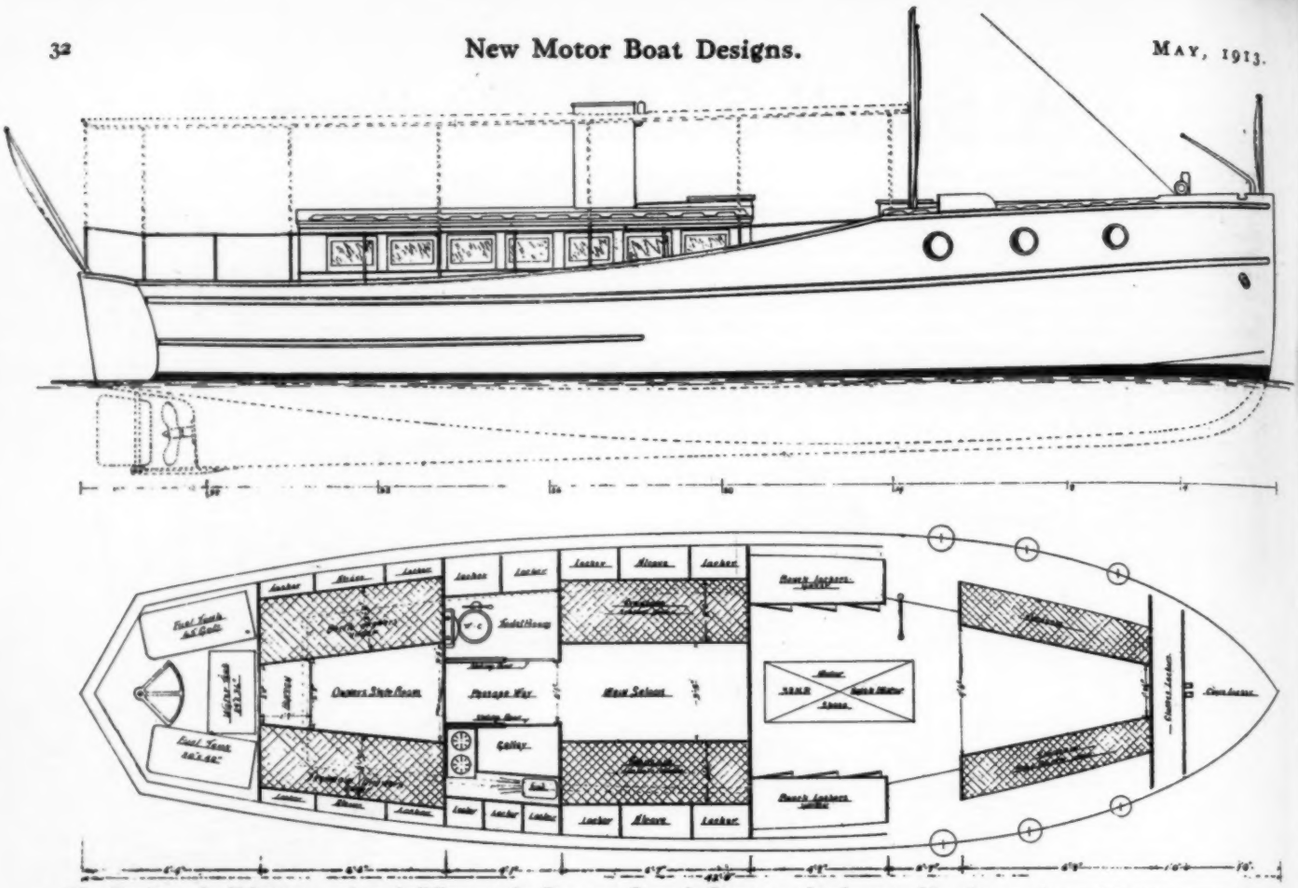
Probably the Largest Cruiser of this Popular Type Thus Far Built.

(*See plans on following page.*)

The cruiser referred to is 42 ft. 6 in. in length and has a beam of 11 ft. The engine is located under the bridge deck, aft of which is the main saloon. Aft of this is the galley and the toilet-room, on opposite sides of a passage leading to the owner's stateroom. A flush deck is located at the extreme after end of the boat, under which are the fuel and water tanks.

The motor is a 32-h.p. 2-cycle Hatch and the fuel used will be kerosene. The lines of the boat are very easy and a speed of 11½ miles per hour is expected.

Separating the stateroom from the main saloon, which will also be used as a sleeping compartment, by a passageway, and so locating the toilet room that it is accessible from either, are good features of the design as is also separating the galley and engine room, although in these days of thoroughly reliable installations of tanks, piping, etc., the latter point is of less importance than formerly. The stack is a feature seldom found on boats of this size and type, but will help ventilate when the windows have to be closed.



The Doyle 42-ft. V-bottom cruiser, building at the Bayonne Launch Company closely resembles the usual round bottom type above the waterline. See description on preceding page.

"One Design" Power Dinghy.

A One-Design Class Powered With a 3 H. P. Ferro Adopted by the H. R. Y. R. A.

FOR the past two summers a great amount of enjoyment and sport in English waters has resulted from the races between the small serviceable one design class of dinghies that has been formed by the yacht and motor boat clubs abroad. Following their example the Hudson River Yacht Racing Association, at their last meeting, adopted a similar class and already orders have been placed for about a dozen of these little craft.

The design that has been worked out by Charles F. Chapman, Commodore of the New York Motor Boat Club, assures a boat that will not only be excellent for racing in sheltered waters but will be serviceable for other purposes as well and will possess a reasonable amount of seaworthiness. The low price at which it will be possible to build the dinghies in a quantity will be taken advantage of by those who cannot afford a larger boat and they will still have one that will answer all the purposes of the average open runabout.

They will also serve as an excellent motor tender for the larger cruiser as they will be easy to tow and stable as well.

The boats will be 12 ft. overall length, slightly over 4 ft. beam and draw approximately 16 inches of water. The single cylinder 3 h.p. Ferro motor, fitted with Perfex ignition, will give them a speed close on to 7 miles per hour, and a 6 gallon full tank will give them a larger running radius.

The keel and stem will be 1⅛ inches white oak, frames 1½" x ⅝" spaced 9" apart. The shaft log, transom and knees will also be of oak. Planking will be 7/16" cedar, copper fastened and finished bright. Inside sheer, stringers and bilge stringers of yellow pine of ample size for rigidity and strength. The engine bed is 1¼" oak and the seats, thwarts and decks of cypress. The price of the boat and engine complete will be $125, and they are to be built by N. Jacobsen, of Tarrytown, N. Y.

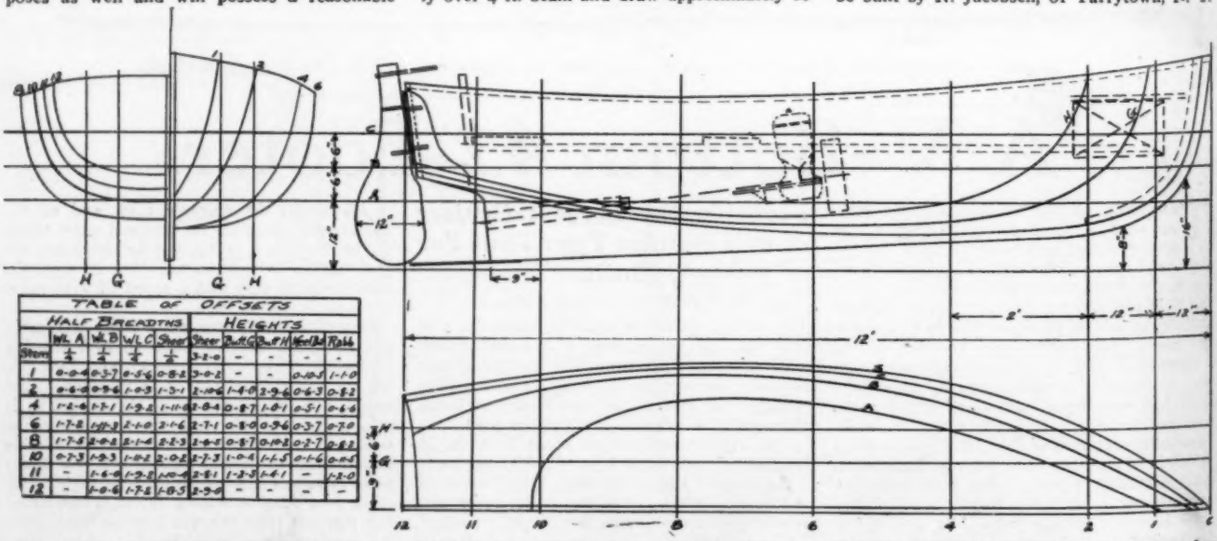
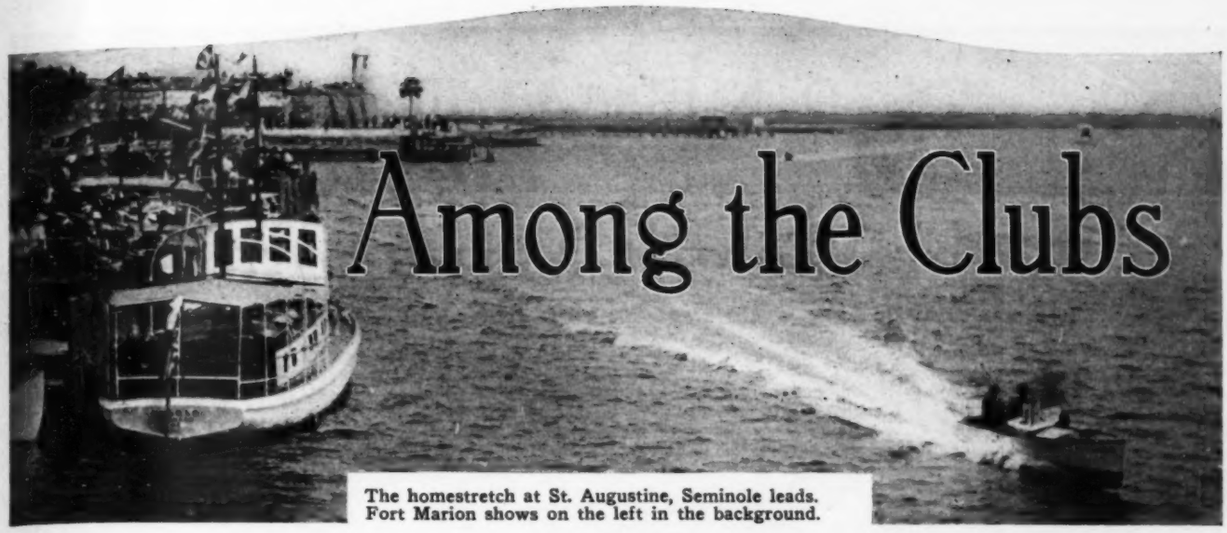


TABLE OF OFFSETS

	HALF BREADTHS				HEIGHTS				
	WL A	WL B	WL C	Sheer	Sheer	B.C	B.H	Keel Bd	Rab
Stem	½	½	½	½	3-2-0	-	-	-	-
1	0-0-4	0-3-7	0-5-6	0-8-2	3-0-5	-	-	0-10-5	1-1-0
2	0-6-0	0-9-6	1-0-3	1-3-1	2-10-6	1-4-0	2-9-6	0-6-3	0-8-2
4	1-2-0	1-3-1	1-5-2	1-11-6	2-8-4	0-8-7	1-8-1	0-3-1	0-6-0
6	1-7-2	1-11-2	2-1-0	2-1-6	2-7-1	0-5-0	0-9-6	0-3-7	0-7-0
8	1-7-5	2-0-2	2-1-4	2-2-3	2-6-5	0-2-7	0-10-2	0-2-7	0-8-2
10	0-7-3	1-9-3	1-10-2	2-0-2	2-7-3	1-0-4	1-1-5	0-1-6	0-0-5
11	-	1-6-0	1-9-2	1-10-4	2-8-1	1-2-5	1-4-1	-	1-2-0
12	-	1-0-6	1-7-2	1-10-5	2-9-6	-	-	-	-

The design for the 12-ft. power dinghy which has been adopted by the Hudson River Yacht Racing Association for its one design class.



Among the Clubs

The homestretch at St. Augustine, Seminole leads. Fort Marion shows on the left in the background.

The Florida Races.

Up to this year the principal southern meet has been held at Palm Beach. Now, St. Augustine has wrested the distinction from her fashionable rival. The construction of a new bridge across Lake Worth, precluded further racing of the first order on this shallow body of water, for it is now almost impossible to find enough water for laying out a decent course. St. Augustine, on the other hand, has an excellent two and a half knot certified course, of triangular shape with a re-entering angle in one leg, and so laid out as to permit a view of the whole course from the start and finish line. But by far the best course for racing is the newly laid out and certified course on the Indian River off Rockledge and Cocoa. The Indian River has plenty of water at this place, and here in one of the choicest fruit sections of Florida between Merritts Island and the mainland is an ideal racing stretch. This new course is practically straightaway down and back to the start, but is in reality a rectangle with eighth of a mile turns at both ends.

Here was held under the auspices of the Rockledge-Cocoa Yacht Club, on March 18th, 19th and 20th, the first recognized meet on the Indian River receiving the sanction of the A. P. B. A. This three-day meet consisted of nine events, two of which were scratch affairs, and the other seven, handicap. With the exception of Carolina II, a speedy hydro, owned by Edw. J. DuMee, of Ocean City, N. J., all of the eleven starters were Florida designed and Florida built boats. Of these the fastest was Greyhound, owned by George Gingras, of Rockledge. She is a 20 foot hydro with 5½ foot beam and powered with a 6 cylinder 75 H.P. Emerson. Though making over this certified course and under certified timing approximately thirty-three miles per hour, Greyhound encountered a mountain of hard luck and was unable consequently to walk off with any of the attractive prizes offered by this prosperous club. The different events produced good racing, however, and, though the times were far slower than of the first order, the finishes were thrillers and excitement ran high. The Cocoa meet is now a permanent affair for the Indian River Championship, with cup prizes having no strings attached. In conformance with the new rule of the A. P. B. A. in the future there will be no racing for cash prizes in Florida waters.

Two weeks after the close of the Rockledge-Cocoa affair the St. Augustine meet took place in connection with the city's celebration in commemoration of the landing of Ponce de Leon. Preparations for this meet unfortunately had to be abbreviated owing to a necessarily late announcement, which greatly handicapped Secretary Charles F. Hopkins, Jr., in his efforts to secure the appearance of some top notchers.

The races for the Southern Championship consisted of the best two out of three races, the first two of 35 nautical miles each, and the final of 10. The outcome was a close race between two Jacksonville speed boats, Seminole and Adelaide, with a final victory for Seminole. There were eight starters.

Besides the races for the Southern Championship, a number of 10 and 15 mile handicaps were run off for boats of different classes.

Pacific Championship.

On July 3, 4, and 5 the annual races for the motor boat championship of the Pacific Coast will be run at Astoria, Oregon. The events will be held under the auspices of the Pacific International Powerboat Association and there will be the following cash prizes: Free-for-all class, $1,000; twenty-six foot class, $600; twenty foot class, $500, and sixteen foot, $400.

Race for Lipton Cup on June 21st.

The date for the first race for the $2,500 Viking Trophy offered by Sir Thomas Lipton has been set for June 21st, 1913, starting at 5 P. M. The course will be from Huckleberry Island, off New Rochelle Harbor, to the west harbor at Block Island, R. I., a distance of 100 nautical miles. This race is open to cruisers having a waterline length between 30 and 38 feet, a waterline beam between $\frac{LWL}{9} + 3'$ and $\frac{LWL}{9} + 5'$ and a piston displacement in cubic inches between $\frac{(L\,W\,L)^2}{2}$ and $\frac{(L\,W\,L)^2}{4}$.

In other words it is a semi-restricted class, the aim being to have a race between sea-worthy boats of sizes and powers not widely different. The crews must consist entirely of amateurs and the handicaps will be based upon the new Viking rating rules which differ materially from the A. P. B. A. rules. These rules are very simple and consider only the bore and stroke of the engine and beam of the boat. They offer a much better chance to win to the cruiser that was not built solely for racing purposes.

The prize for this race offered by Sir Thomas Lipton must be won three times by the same owner to become his permanent property. The New York Athletic Club under whose auspices this race will be run, have offered a trophy under the same rules to go to the winner and to become his property at once.

There is also a cup offered by a prominent yachtsman to the boat defeating the largest number of boats which compete in the three most important long distance races in the east this year—The Block Island Race on June 21st, the New York-Albany and return Race on June 28th and the New York-Cornfield Reef and return race on July 12th.

Simultaneously with this race will be held the annual race of the New York Athletic Club to Block Island in competition for the Day Trophy and boats competing for this may also compete for the Lipton Trophy at the same time. The race for the Day Cup is open to cruisers between 25 and 40 feet overall length.

"Seminole," winner of the "Championship of the South." This boat is powered with a 40-50 h.p. Buffalo Automarine motor.

Busy Season for Chicago Fleet.

At a recent meeting of the Chicago Motor Boat Club, elaborate plans were laid for a very busy summer season. Races will be held off Lincoln Park twice a month, under the recently adopted rules of the Mississippi Valley Power Boat Association with which the club is affiliated as well as the Western Power Boat Association. Long Distance cruises will occupy the alternate two weeks of the month. The following officers were elected: Commodore, W. W. Nugent, Vice-Commodore, P. A. Hees; Rear-Commodore, H. S. House; Secretary, W. Gray; Treasurer, Geo. H. Baker.

Pleasant Outlook for Oswegatchie Yacht Club.

The Oswegatchie Yacht Club is planning to make that organization one of the most active on the St. Lawrence. Although only a year old, they own their own grounds, docks and boat houses, among which are a dozen 45-foot slips and six 60-foot basins to receive power crafts. The members also are making every effort to obtain additions to the membership of the club.

(*Continued on page 70*)

"Seminole" and "Adelaide" rounding the stake in their exciting duel for the Southern Championship. The insert gives an interesting bird's-eye view of two of the racers.

MARINE MOTORS

Light Weight Maximotors.

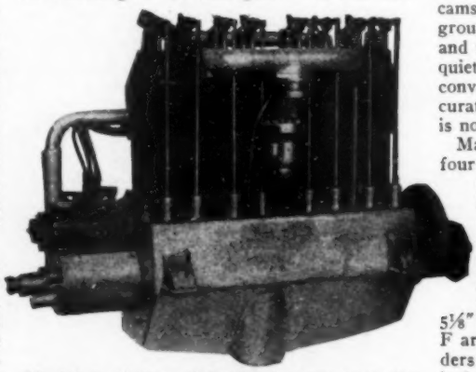
Four Models of the Four Cycle Type Weighing less than 5 lbs. per Horsepower.

ENGINEERS of the Maximotor Co., of Detroit, Mich., have been planning and experimenting for nearly two years with the present new Maximotor and only after the most thorough investigation and severe tests, under which this motor has shown wonderful staying qualities, have they concluded to manufacture this type of motor and offer them for marine and aero-nautic service.

Maximotors are of the four-cycle type with over-head valves built in a factory devoted exclusively to the manufacture of Maximotors, and they are not built merely as a side line. While the Maximotor is a good example of a light-weight high-speed and powerful type of motor, yet its lightness has not been attained by cutting down to extremes the size and strength of the various parts. The joining together of parts where possible, and the elimination of others not absolutely necessary, combined with the highest grade material has brought about the solution of the weight problem in the construction of this motor.

Compactness has been carried out as well, making the motor especially desirable for hydroplane and hydro-aeroplane installations.

The crank shaft is made of chrome nickel steel, double heat-treated and having a tensile strength of 150,000 to 170,000 lbs. It is hollow-bored, machined and ground to within a thousandth of an inch. The connecting rods are of an I-beam section of chrome nickel steel, drop-forged and are fastened at their crank shaft bearings by two nickel steel studs, being locked with two hardened jam nuts and cotter pins. The crank case is cast in one piece of special aluminum alloy with valve lift guides. The end plates act as housing for the crank shaft ball bearings. The front disc also serves as a housing for the time gear. The rear disc supports the magneto and water pump and also houses the driving gears.



Model B, light weight Maximotor 60-70 h.p.

The cylinders are cast in pairs and ample water space is provided for cooling. The intake and exhaust valve seats are completely surrounded by water, making over-heating and warping impossible. The material consists of Vanadium gray iron of high tensile strength, making light cylinder and jacket walls possible. Cam shafts consist of special tubing. The cams are of an elliptical form, hardened and ground and held in place by taper steel pins and these, in turn, by cotter keys, producing a quiet rotary movement.. Pistons are of the convex type made of Vanadium gray iron, accurately machined inside and out so that there is no possibility of unequal expansion.

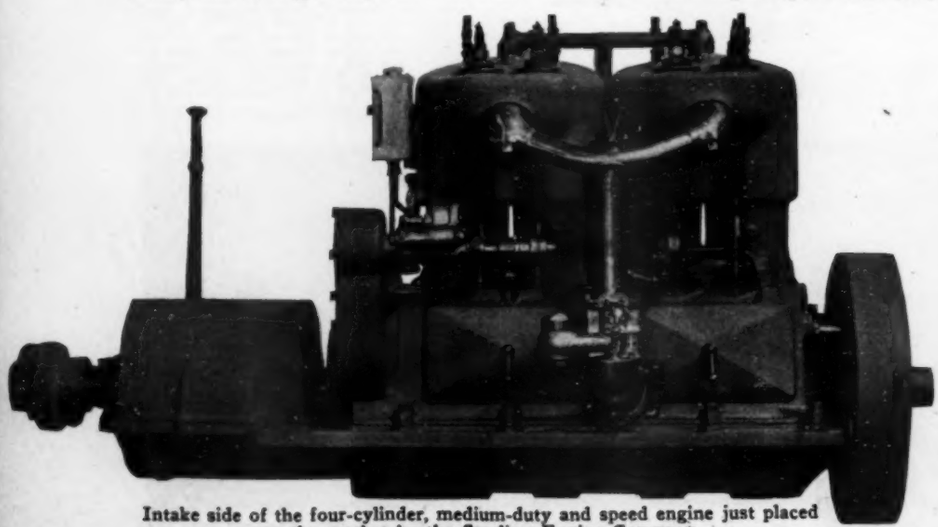
Maximotors are made in six different models, four being stock models and two made-to-order only. Model A, four cylinders, 40-50 h.p., has a bore of 4½ inches and a stroke of 5 inches, weighs 200 lbs. complete. Model B, 60-70 h.p., four cylinders 5⅛" x 5½", weight 245 lbs. Model C, 70-80 h.p., six cylinders 4½" x 5", weight 275 lbs. Model D, 90-100 h.p., six cylinders 5⅛" x 5½", weighing 350 lbs. Models E and F are made to order only, four and six cylinders 6" x 6", rating 100 and 150 h.p., respectively.

New Sterling Motors.

Two New Models of Heavy Duty Types and Two of the Medium and Speed Engines.

FOUR new engines have just been placed on the market by the Sterling Engine Company. Two are heavy-duty engines. One has four cylinders with a bore of 6½ inches and stroke of 9 inches, rated at 45-60 horsepower. The other heavy-duty machine has six cylinders with the same bore and stroke, rated at 70-90 horsepower. The other two are four-cylinder medium-duty and speed engines. One has a bore of 4¾ inches and stroke of 5½ inches, rated at 20-35 horsepower. The other has a bore of 5½ inches and stroke of 6 inches, rated at 30-50 horsepower.

All these engines are of the most recent type and embody the latest improvements in design. Flexibility, reliability and an abundance of power are their chief characteristics. The Sterling heavy-duty type is very flexible, due to the careful designing and balancing of cylinders and other parts. They are heavy-duty engines in every particular, but are capable of running at much higher speed than some makes. It is principally for this reason and the great strength they possess that the United States Government selects them to power most of her battleship tenders and barges.



Intake side of the four-cylinder, medium-duty and speed engine just placed on the market by the Sterling Engine Company.

An original Sterling feature is the new crank shaft suspension, the shaft being hung from the upper base instead of being supported from beneath. This insures absolutely perfect alignment and allows bearings to be taken up quickly and easily. This design is recommended by leading authorities of the engineering profession. All the noted automobile designers of the world have adopted it.

The new Sterling engines complete a practical and efficient line for 1913 and cover all marine purposes. Ratings of all motors are conservative. In each instance they will develop greater power than that specified. They are built and thoroughly tested in one of the most complete and modern factories in the world devoted solely to the manufacture of gasoline marine engines. This plant has been doubled in size and equipped with the latest automatic speed devices.

In addition, there is the little "Sterling Kid" engine, 10 h.p., 4 cylinders, 2¾" bore, 4½" stroke, designed especially for high-class yacht tenders, small auxiliary power and small runabouts. It weighs only 215 pounds and develops its power at 1,000 r.p.m. This motor is a decided contrast to the mighty 8-cylinder, 150-180-h.p. racing engine which accomplished so much in last season's races.

The new Sterling catalog containing a complete line of photographs of all the country's notable boats of the season will be sent free to anyone on request.

The Watkins Canoe Motor.

A Two-Cycle Line of Three Models Consisting of One, Two and Four Cylinders, Suitable for All Classes of Light-Weight Service.

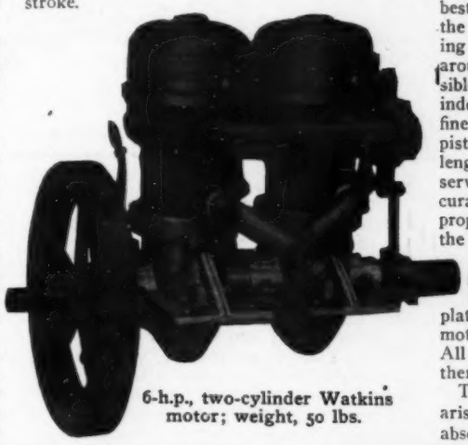
THE development and perfection of a light-weight two-cycle motor suitable for use in canoes and dinghies has attracted the attention of engineers throughout the country for some time past and it is only within the last few years that their efforts have been rewarded with a type of motor that the average inexperienced motor boatman would pass upon as being satisfactory for his requirements. One of the very few companies who have a satisfactory motor of this type on the market for 1913 is the Watkins Motor Company, of Cincinnati, Ohio. The result of their many years of experiments and long experience have enabled them to turn out a product which is most suitable for these uses from every standpoint.

The Watkins motor line consists of three models, the 3-h.p. single-cylinder size weighing 30 lbs., a 6-h.p. double-cylinder motor weighing 40 lbs., and a 12-h.p. four-cylinder motor weighing 100 lbs.

In construction and design, no pains have been spared to turn out the best product possible. No useful parts have been omitted and no useless parts retained, and it may be well said that their motors meet every condition. Their small 3-h.p. motor has been installed in the 22-foot fishing boats which go out in the roughest of weather. The motor, being so small and compact, is placed within 12 inches of the transom under the rear seat and out of the weather.

Instead of casting the water-jacket on the cylinder, a water-jacket of spun copper is used. This permits of ample cooling efficiency to keep the motor at the proper temperature; is of ample strength to withstand any ordinary strain, and, at the same time, adds to the general appearance of the motor. The crank shaft is 1 inch in diameter, made from the best quality of drop-forged steel, turned perfectly true and filleted at all corners.

The main crank bearings are 2¼ inches long and are made of the very best quality of phosphor bronze, from which material the connecting rod is also made, the latter having a split box on the crank end which allows for easy taking up of any wear or a loss motion. The jump spark system of ignition is used, and to start it is simply necessary to place the speed lever in a position that will cause the spark to take place when the piston is at the top of the stroke.



6-h.p., two-cylinder Watkins motor; weight, 50 lbs.

The water-circulating pump is of the plunger type and constructed of brass, being placed on the motor in such a position that it is easily accessible. The carbureter is of special design and the proportionate areas have been developed so thoroughly and such exhaustive and severe tests made that perfect control is obtained at all times. Running at full speed, there is practically no vibration and the gasoline consumption is very small.

Watkins motors are all of the three port two cycle type, the ports being so arranged as to permit of high speed. The bore of the cylinder is three inches and the stroke three inches.

The base or crank case is made of the very best grade of aluminum and so arranged that the cylinder is clamped to the same, there being about 15 inches of clamping surface all around. By this clamping method it is impossible for the cylinder to work loose. The cylinder itself is made of a specially hard and fine grain cast iron, insuring long life. The piston is made of a similar material and of a length that long experience has proven most serviceable. These pistons are packed by accurately ground snap rings and are fitted with proper grooves for distributing oil evenly over the entire wearing surface.

The Watkins Shops are equipped with machinery and appliances of the most modern type. By means of special gigs, templates and tools, each part of every Watkins motor is an exact duplicate of its counter-part. All parts which go to make up the motors are therefore absolutely interchangeable.

This makes it possible, should the occasion arise for the replacement of any part, to be absolutely sure that the new part will fit.

The Leary Twin Port Engine.

A Two-Cycle Type with Excellent Speed Control and Minus the Backfiring Qualities.

THE Leary twin port engine, manufactured by the Leary Gasoline Engine Company, of Rochester, N. Y., is now in its third season and the manner in which it has met all the demands made upon it have proven conclusively that it is equal to any service.

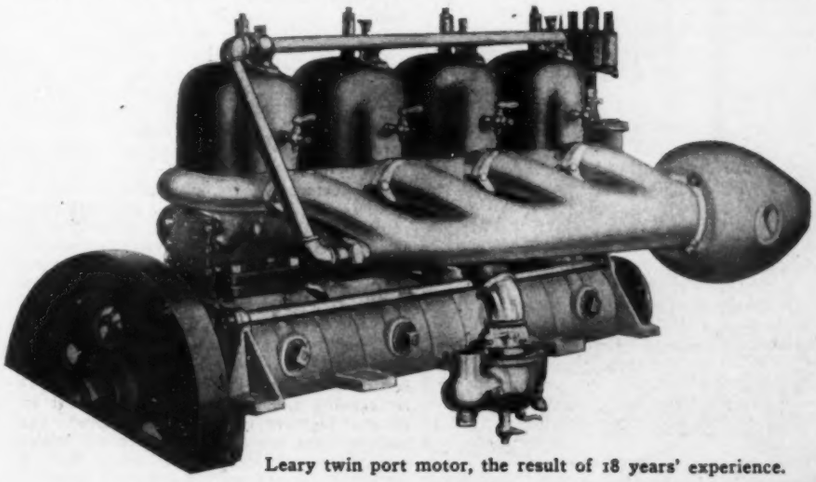
This motor is the result of 18 years of experience and, being of the twin port type, the most perfect control is claimed. The carbureters once set require no further attention, one lever automatically controlling both carbureters and timer so that when the engine is running at its highest speed the lever may be thrown to the slowest speed notch without the engine backfiring. Very slow speed is then obtained with even explosions.

Every feature of the motor shows careful thought and has been built with the most painstaking care throughout. The non-backfiring discs do away with that most objectionable feature in the two-cycle motor and the mixture correctors save one-third on fuel. It is claimed that distillate can be used with satisfactory results without making the slightest change in the motor, for heat from the annular exhaust chamber radiates down into the intake casting which, in conjunction with the mixture correctors, converts the distillate into a fine explosive mixture.

The exhaust gases leave the cylinder through four passages equally divided around the cylinder and enter an annular chamber leading to the expansion chamber. The bearings are die cast, interchangeable and made of the finest metal. The strong tubular crank case accounts in part for the bearings of the Leary motor not cutting, for the strength and rigidity prevent the shaft from bending to conform to every irregularity in the foundation. Fine compression is found on every engine and the arms of the crank throws are fitted with counter-balance discs that nearly fill the crank case and give a crank case compression of about 7 pounds.

The oiling system is that of mixing the oil with the gasoline which has proved satisfactory for several years past. The Atwater Kent unisparker and coil are used, making it possible to start the multi-cylinder engines on the switch. Each Leary motor is sold complete with two Schebler carbureters, Baldridge reverse gear, salt-water fittings, propeller, batteries, etc.

The Leary motor is the result of John J. Leary's long experience in connection with the manufacture of gasoline motors. He has devoted his undivided attention during the period of 18 years to the designing and manufacture of two cycle motors and the designing of semi-speed hulls. He has on this twin port two cycle motor accomplished many things in a most skillful manner which have not been done in the design of many two cycle motors now on the market. Mr. Leary, in his 18 years of study and experimenting, has tried out dozens of methods for obtaining high power and perfect control, but in no other manner has he been able to accomplish these as effectively as with the twin port system, and his backfiring devices solve another objectionable feature.

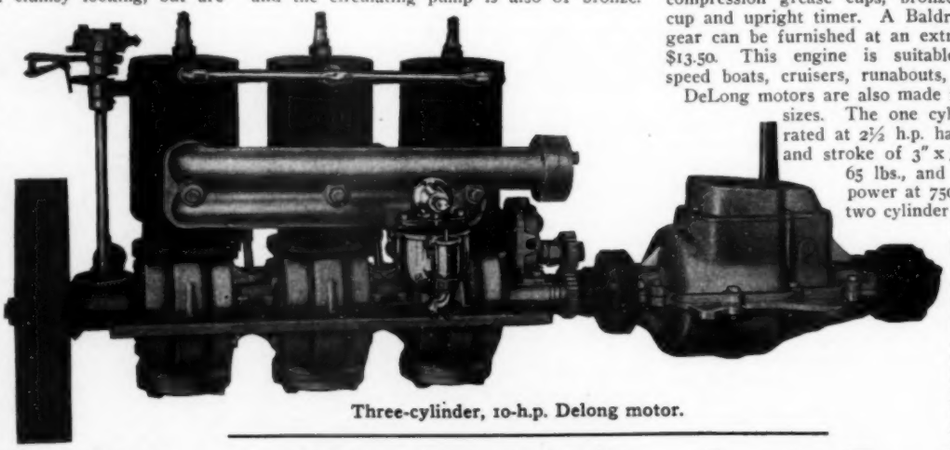


Leary twin port motor, the result of 18 years' experience.

The DeLong 10 H. P. Motor.

DELONG motors represent a high development in the art of designing and building two cycle engines. They are not big, heavy and clumsy looking, but are light weight, finely constructed and beautifully finished.

The three cylinder Delong motor develops 10 h.p. at 750 r.p.m. and sells for $175. It has a bore and stroke of 3" x 3½" and weighs complete, 150 lbs. Material used in the construction of this engine is the very best to be had. Every part is standardized and absolutely interchangeable. The pistons have an extra length to insure long life and the crank shafts are of high grade steel, heat treated. The bearings are of genuine motor babbit and bronze and the circulating pump is also of bronze.



Three-cylinder, 10-h.p. Delong motor.

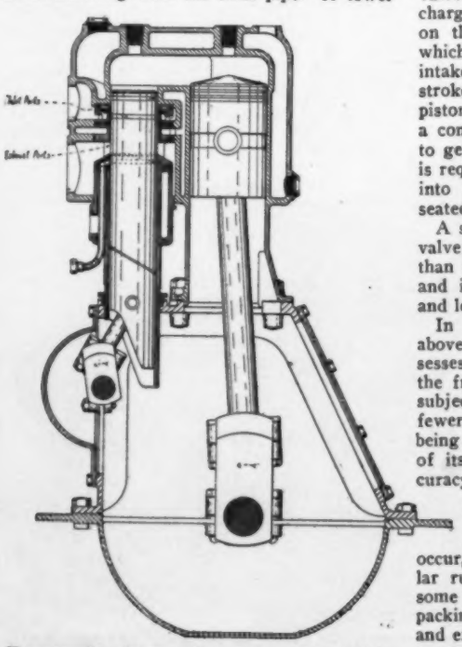
The equipment of the three cylinder engine consists of a three cylinder box spark coil, spark plugs, carbureter, shaft coupling, compression grease cups, bronze circulating cup and upright timer. A Baldridge reverse gear can be furnished at an extra charge of $13.50. This engine is suitable for small speed boats, cruisers, runabouts, etc.

DeLong motors are also made in two other sizes. The one cylinder model rated at 2½ h.p. having a bore and stroke of 3" x 3½", weighs 65 lbs., and develops its power at 750 r.p.m. The two cylinder model, having a similar bore and stroke, is rated at 5 h.p. at 750 r.p.m. This model weighs 90 lbs. complete with full equipment to run.

A Slide Valve Marine Engine.

IN THE accompanying drawing is shown a sectional view of a four cycle marine motor, having a new slide valve system in place of the customary poppet valve which has recently been brought out by Mr. A. E. Osborn of New York City. A particularly important feature of this valve mechanism in connection with marine work where the engine is enclosed in the cabin is its silence and also on account of the large positively timed port openings there is much less friction in this mechanism than with the usual cam motion and springs. The valve piston will also generate a small amount of power in itself which adds to the power of the motor.

From the drawing it will be seen that a single valve piston is employed for controlling both the intake and exhaust ports and this piston is arranged in the small cylinder at the side of the main engine and opening into the top of the combustion chamber. The valve cylinder is provided with an annular port completely surrounding the cylinder and communicating with the inlet pipe. A lower annular port opens directly into the exhaust chamber. The pistons when in the position shown are at the upper end of the compression stroke. The upper or inlet ports are uncovered during the descent of the valve pistons before the exhaust port is opened. A V-section suction operated ring valve as shown in the drawing, is used to prevent the expanding gases passing into the inlet chamber and pipe. In order to get this ring valve in place the lower part of the valve cylinder is made removable and is held in position by a stud and nut at each side. It is cooled by the fresh intake gases as well as thoroughly protected from carbon by the valve piston.



Four cycle piston valve motor invented by A. E. Osborn.

The spark plug is located above the valve piston. As the explosion forces the main piston down the timing gear and valve shaft revolve, moving the valve piston downward which after the main piston is about half way down, uncovers the inlet port and when the main piston is near the bottom center opens the exhaust port. This port, of course, remains open during the exhaust upward stroke but is closed just as the piston starts to descend on the next stroke. The vacuum now created above the main piston raises the ring valve and allows the admission of a fresh charge. When the main piston starts upward on the compression stroke the valve piston which has been traveling upward, closes the intake port so that during the compression stroke, both ports are shut off by the valve piston. The ring valve has the time of nearly a complete revolution of the motor in which to get down on its seat and a very small lift is required to get the necessary amount of gas into the cylinder and it can easily become seated before the inlet port opens.

A special oil connection is provided for the valve piston. This motor contains fewer parts than many others with the slide valve system and is consequently cheaper to manufacture and less liable to get out of order.

In addition to the advantages mentioned above it is claimed that this valve also possesses features of cooling easier (owing to the fresh intake gases passing over the parts subject to the greatest heat), of containing fewer parts than other slide valve systems, of being cheaper to manufacture, not only because of its few parts, but also because great accuracy of workmanship with close fits (likely to seize) are not needed to maintain tightness as regular piston rings are used at the only points where leakage could occur, eliminating the objectionable irregular running and lack of power exhibited by some slide valve engines at low speeds (as packing rings are always between the intake and exhaust port and leakage between them is prevented), and of needing absolutely no valve grinding or adjustments or other attention.

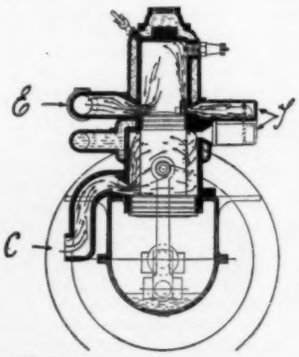
Superior Two Cycle Motors.

THE Superior Motor Company, of Detroit, Mich., manufacturing under the Fraser-Brimmer patent, have just placed upon the market a two cylinder two cycle motor of 3½" bore and 4¼" stroke. This motor is of the compression cylinder type, one cylinder being used for compressing the gases and the other for the explosion.

The high vacuum present above the piston causes a rush of gas from the carbureter which completely fills the large diameter compression cylinder when the piston is near the bottom of the stroke. As the piston moves slightly upward the inlet port is closed and the charge slightly compressed, whereupon it is transferred through the cross-over pipe to the working part of the adjacent cylinder.

The advantages claimed for this motor are high volumetric efficiency at all speeds on account of the large ports. A minimum of side thrust between the piston and the cylinder walls, absence of valves, springs, etc., and the elimination of crank case compression.

On the very thorough test which has been recently completed by the Superior Motor Company, it has been found that the engine would operate very satisfactorily on the mixture of half gasoline and one-half kerosene, the gasoline testing at .740 and the kerosene at .807 specific gravity. Pure kerosene of the above density was tried and worked as satisfactorily as the gasoline and kerosene mixed. Next mixtures of kerosene and lubricating oil were tried in proportions of one part of lubricating oil to three and seven parts of kerosene. These all work satisfactorily but the mixture with the greatest amount of lubricating oil would have eventually fouled the engine.



Section of the new Superior motor.

From Motor Boating Readers

A Department for the Exchange of Ideas and the Discussion of Questions of General Interest. Editorial Opinion on a Number of Questions Submitted by Readers of the Magazine.

MoToR BoatinG's columns are open to its readers, not only for asking questions, but for placing before them other readers' ideas, results of experience, opinions, etc., that should be interesting or helpful to them; but the editor will not, of course, be responsible for any opinions expressed or statements made in such communications. The name and address of the writer must necessarily be given in every case to make on answer by mail possible (no anonymous contributions will be considered for publication), but names will be omitted in publishing the letters and answers where desired, in which case it is desirable that initials or other distinguishing signature be appended. Through the correspondence department readers of the magazine may be of direct aid to one another in solving the problems of motor boating.

Side Planes to Increase Speed.

To the Editor of MoToR BoatinG, *Sir:*

I have a hull 26' long by 4' 6" beam that I built myself and in which I installed a 20 h.p. automobile motor. I use a 16" wheel 22" pitch and the engine turns up about 900 or 1000 r.p.m. without any strain on engine. I placed the engine too far forward. When I am running at full speed the bow plows through the water instead of over it as it should. The hull draws about 4" at bow, about 8" under engine, while at the stern she doesn't draw any. That's with one or two people in the front seat; if I carry four or six people she rides the water just right and the bow comes up as it should. I read in your June number of MoToR BoatinG where some of the boats at Monaco used bilge fins successfully. Do you think they would help my case any? I have gotten better than 16 miles with this engine as she is and don't want to move it unless I have to. Everything is placed in the hull just as I want it and I have things arranged to give plenty of seating capacity. The only drawback is that I can't ride any waves, not even little wind waves as the bow throws a spray all over the hull. If you think the fins will help me any please tell me how long to make them, whether to let them extend above the waterline, how wide to make them, how to fasten them to hull and keel, where to place on hull, that is how far from bow and what material to make them from.

J. H. V., Charleston, W. Va.

[We would not advise these if you desire to get more speed, as they are only of benefit to very light boats, making in the vicinity of 30 miles an hour and even then any benefit is doubtful. However, these are used to considerable extent to throw the spray away from the boat which, if used in connection with your craft, we believe would make her a decidedly more comfortable boat. The correct position of these will have to be ascertained from observation by yourself as they should be placed near the waterline in such a position as to throw the spray outward. They are generally made about 3 or 4 inches wide and 4' long having a slight upward inclination (1" in 4') toward the bow, and generally made of stiff brass turned over at the inner edge and fastened to the hull by means of screws.

We have also seen these spray boards placed up at the sheer line, in which case they would have to be made considerably wider than if placed at the waterline.]

Motor Will Not Start.

To the Editor of MoToR BoatinG, *Sir:*

As a subscriber I would like to have your assistance in regard to a 3" x 3¼" four cylinder motor two cycle. I purchased a 1¼" carbureter and have not been able to get one explosion. I have a 1¼" manifold. The motor runs with an old one inch carbureter, but no speed. I was advised to get the 1¼" carbureter for speed. Can you tell me where my trouble is?

Dayton, O. S. C.

[It is rather hard for us, with the data you have given us to diagnose the trouble with your four cylinder motor. The size of the carbureter should have little to do with being able to start the motor, although it may have considerable to do with getting the most power out of your motor. On the other hand, we do not believe that the importance of using the correct size of carbureter should receive as much attention as one generally gives it, as the size of the valves, weight of the moving parts, etc., are fully as important as the size of the carbureter. If the valves are of the wrong dimensions, then no change in the carbureter size will help this very materially, nor can you expect more power by increasing the size of the latter. However, we would advise you to look elsewhere for the cause of your trouble, such as having a good hot spark, proper mixture, absence of flooding, carbureter open, piston rings that are not worn, gummed or rusted, right adjustment to the coil, if of the jump spark type, and be sure that your exhaust line is clear and the muffler not rusted, to obstruct the passage of the exhaust gases. Oftentimes good results can be obtained by pouring a little cylinder oil through the pet cocks and working the pistons up and down a few times to thoroughly spread the oil over the cylinder walls. This will help the compression considerably and should assist you in starting, especially when priming. If you have not a clutch try to run the motor free with a propeller shaft uncoupled and be sure that the needle valve is not open too far to cause flooding.

Route to Lake George.

To the Editor of MoToR BoatinG, *Sir:*

Kindly give me all the information on the following subjects that you can. What is the name of the canal that runs from the Hudson River into Lake Champlain, and does the canal start from Albany or Troy? Where can a permit be procured to go through this canal? Is there a canal from the Hudson River to Lake George and if so does the canal start from Albany or Troy and what is the name of the canal? Is there a canal from Lake George to Lake Champlain and what is the name of the canal? Must permits be procured to go through all these canals? What is the speed limit on these canals for a motor boat 19 ft. long, 4 ft. beam, drawing 2 ft. of water; speed of boat 25 miles per hour? Where can I procure a chart of the Hudson River from New York to Troy? Where can I procure a chart of Lake Champlain?

New York City. J. R. S.

[The canal that runs from the Hudson River to Lake Champlain is known as the Champlain Canal. It runs from Troy at the head of navigation on the Hudson River to Whitehall, the southern extremity of Lake Champlain, a distance of something like 70 miles. A permit to navigate on this canal is obtained from the Department of Public Works, Albany, N. Y., either upon written application or by a personal call, there being no charge for this permit.

There is no canal from the Hudson River to Lake George. In fact there is no means of entering Lake George without carrying the boat over land for a short distance. The nearest water entrance is from the head of Ticonderoga Creek, which is some 20 miles north of Whitehall on Lake Champlain. There a carry of about 3 miles is necessary, to the northern end of Lake George. Lake George may be also entered by carrying over land from Glens Falls on the Champlain Canal to the town of Lake George, which is at the southern extremity of the lake. This carry is considerably longer than the one at the northern end of the lake. There is a speed limit of about 4 miles an hour in force on these canals.

Charts of the Hudson River from New York to Troy may be obtained from the Department of Commerce and Labor, Coast and Geodetic Survey, Washington, D. C., as may also be obtained charts of Lake Champlain.]

Propeller and Electrical Equipment.

To the Editor of MoToR BoatinG, *Sir:*

Will you be kind enough to give us your opinion on the following: Our boat is an open launch, semi-speed hull, 24' 5" long, 5' 2" beam, with a 2-cylinder, 2-cycle marine engine of 8-h.p. at 450 r.p.m. We have made 750 r.p.m. We have a 16" three blade propeller, 22.6" pitch. Would an 18" 2 blade or an 18" 3 blade increase our speed, or would a smaller propeller be better? Our shaft log is about 4 ft. forward of the end of stern and the propeller close to the shaft log, or would it be better still further aft? The engine is placed pretty far forward and it seems that our bow ought to be higher out of the water. The boat is on a very even keel and when throwing in clutch the bow does not rise, nor does the stern sink. Would we gain by putting ballast in the stern or would you advise moving the engine further aft? We are thinking of putting in a magneto for our spark and also for lighting search light and running and tail lights. Can you give us some idea as to price and also as to space occupied by a suitable jump spark magneto? Also, is there some way of charging batteries so that we would have light when engine is not running? Is it possible to avoid all vibrations of an (unopposed crank) counter balanced engine? Can you give us some idea as to cost per foot of seat cushions?

Milwaukee, Wis. A. E. B.

[From your statements we should judge that your motor was designed to attain its power at 450 r.p.m. If this be the case, we believe that you are using a wheel entirely too small, both as regards diameter and pitch, to obtain maximum speed. We would advise one of three blades 19 inches in diameter by 28 inches pitch or one of two blades 20 inches in diameter by 28 inches pitch. The latter wheel should give you more speed, but the former a smoother running outfit. As to the position of your wheel, we believe that this is now about right and that no material benefit would be obtained by a change in its position.

As to the fact that your boat does not rise in the bow or squat at the stern when coming up to speed, this is not a bad feature at all and we would not advise any ballast whatsoever, unless you believe your boat is now down by the head, which causes her to plow through

the water. From your letter we are not able to say whether this is the case or not, but if it is considerable, ballast in the stern should greatly help her speed.

Exhaust Installation.

To the Editor of MoToR BoatinG, *Sir:*

My 21-h.p. 3-cyl. 2-cycle motor is to be placed under the bridge deck of my 30-foot launch, so that I must exhaust out the side of the boat. Shall I exhaust above or below the normal water line? Is a flexible coupling necessary between the engine and outlet? If so, how is it best installed? Is it not a good plan to turn in all the circulating water if the exhaust is piped to drain well? Will the action of the waves cause the motor to run irregularly? Will the odor of the exhaust be troublesome in the cockpit? I propose to equip this engine, whose normal speed is 900, with a three-blade propeller which it will turn at this speed as a maximum, but propose to throttle down to a normal operating r.p.m. of about 600, giving about 15 h.p., which drives the boat satisfactorily. Will the propeller be operating efficiently? Will the consumption of gasoline be in proportion to speed? Will there be proportionately less wear on the engine and a longer life to the cylinders and bearings? Are there any objections to the plan? Does fuel lubrication decrease the efficiency of the gasoline? If, in a new engine, approximately 200 miles of running are required to wear the bearings to a fit (connecting rod), *about* how many miles of service will be given before adjustments are necessary?

W. K. B., Wood's Hole, Mass.

[It is not quite clear in our mind whether it is absolutely necessary for you to bring your exhaust line out through the side of your boat, as the statement in the first paragraph of your letter is ambiguous. We know of many installations, similar to yours, where the engine is under the bridge deck of a boat, not differing materially in size from yours, where the exhaust is led aft under the cockpit floor or sometimes under the cabin floor, if there happens to be an after cabin, in a very satisfactory manner. Exhausts out of the side, while used to considerable extent, are not, in our minds, nearly as satisfactory as the exhaust through the stern, so we would advise, if it is possible, that you change your plans with this end in view. If you have to exhaust out of the side of the boat it is probably better to do so above rather than below the waterline, as the best place for an under-water exhaust is at the quarter, so you will see with the stern exhaust it will be feasible to bring it out either above or below the normal waterline. However, if the latter scheme is used, it should be brought out only a very few inches below the waterline when the boat is under way and should have an expansion chamber between the engine and the outlet, unless diameter of the exhaust line is exceptionally large. By using the large expansion chamber between the engine and the outlet a satisfactory side under-water exhaust may also be arranged.

It is not necessary to provide a flexible coupling between the engine and the outlet, provided the engine bed is correctly constructed and the engine well balanced to reduce vibration to a minimum.

Many of the installations turn all of the circulating water into the exhaust line, although this tends to reduce the speed considerably if much more water than will readily vaporize is employed. The correct amount can easily be obtained by fitting a Globe valve between the outboard and exhaust connections of the circulating waterline.

Normally, the action of the waves will not cause the motor to run irregularly, provided the whole plant has been correctly installed. However, some racing might occur especially in a following sea when the waves are exceptionally large, but this condition is the exception rather than the rule and should cause no trouble.

The odor from the exhaust may be somewhat disagreeable in the cockpit with a side exhaust, when the wind is in the right direction, but this again is the exception rather than the rule. The worst will probably be when the amount of water admitted to the exhaust line is such as to form a cloud of steam, which is blown back and condenses all over the cockpit and its occupants, but a little care and thought given to this matter should rectify all evils.

We believe you are making a great mistake in equipping a cruiser, provided yours is of the average proportions, with an engine whose normal speed is 900 revolutions. Your method of getting around this by throttling down to about 600 will work out fairly satisfactorily, but is only a makeshift at its best, if you care anything about getting the highest efficiency out of your whole plant. To be sure, the consumption of gasoline will be somewhat in proportion with the speed of the engine and there will also be proportionately less wear on the engine and a longer life to the cylinders and bearings, but these latter points are not in direct proportion to the loss in power and efficiency. There are many engines on the market much more suited for your boat, we believe, than the one you have chosen.

Lubricating oil, added to the gasoline, does decrease somewhat the revolutions and power obtainable from a given engine, but we believe the many advantages gained therein considerably outweigh any of these losses.

It is impossible to give an answer to your fourth question that would be of any value whatsoever. For example, some engines which you say require approximately 200 miles of running before the bearings are broken in will, in another 200 miles or less of running, require an adjustment. While, on the other hand, there are many motors which may be operated continuously for four seasons without even making a single adjustment to the bearings and they are in as good condition now as ever.]

Gearing Motor to Propeller Shaft.

To the Editor of MoToR BoatinG, *Sir:*

I am building a 20 ft. hydroplane and I am trying to figure on how I can get my engine in the back of my boat. I see on Baby Reliance II they have the engine in the back of the boat. I have an idea that this engine is put in backwards and the shaft is run up in the bow where it is geared or fixed with sprockets and chain, but I wish you would let me know if I am going at this right and if I am not, I wish you would let me know how it is done and if they gear them, which way would be the best. I am anxious to find out if I can. My boat is 20 ft. long, 4 ft. 6 in. beam and I am putting in a 30 h.p. light weight engine 1200 r.p.m. Please state what kind of gears I have to use and where I can get them.

Elgin, Ill. F. A. F.

[You are right in your conclusions about the manner in which the engine was placed in the Baby Reliances, but we can see no advantages in following this installation in your boat where the power is less than one-fifth of that used in Baby Reliance II. Practically the only advantage to be gained by placing the engine aft and gearing it to the propeller shaft is that it allows the latter to be turned at a faster rate than if connected direct, thus requiring a smaller diameter propeller, which is a necessity in high speed boats with high powered engines, as there would not be room enough at the stern to swing the proper diameter wheel with the engine connected direct. Of course, the position of the engine in the hull has a great influence also when dealing with 1500 or 2000 lbs. in a 20 ft. hull, but in your case this consideration can be almost neglected as the position of the crew will balance the weight of the engine.

If you will refer to the January issue of MoToR BoatinG, you will see described several methods of connecting the engine and propeller shaft together when they are not on the same shaft.]

Size of Pipe Fittings.

To the Editor of MoToR BoatinG, *Sir:*

As an interested subscriber to your magazine, I would be glad to receive suggestions for pipe fitting. I am fitting out a boat and find difficulty in selecting piping with right kind of thread, diameter, etc. Does a certain pipe dimension mean the diameter of the whole pipe?

Brooklyn, N. Y. NOVICE.

Below we give the dimensions of standard wrought-iron pipe:

Inside Diameter, Inches	Actual Outside Diameter, Inches.	Thickness, Inches.	Actual Inside Diameter, Inches.	No. Threads Per Inch of Screw.
⅛	.405	.068	.270	27
¼	.540	.088	.364	18
⅜	.675	.091	.494	18
½	.840	.109	.623	14
¾	1.050	.113	.824	14
1	1.315	.134	1.048	11½
1¼	1.660	.140	1.380	11½
1½	1.900	.145	1.611	11½
2	2.375	.154	2.067	11½
2½	2.875	.204	2.468	8
3	3.500	.217	3.067	8

Power of the Motor.

To the Editor of MoToR BoatinG, *Sir:*

Below you will find a question which has been puzzling me for some time and for which I should be much obliged to receive an answer through the column of your magazine. What is the ratio of actual horsepower to the bore, the stroke remaining the same? 2. To the stroke, the bore remaining the same, and how far does the stroke actually affect the real horsepower of a motor?

New Haven, Conn. M. E. L.

[With the stroke and revolutions remaining constant the power of the motor will vary as the square of the bore or directly as the area of the piston. For example, an engine with a bore of 6 inches should develop four times as much as that developed by an engine with a bore of 3 inches, other things being constant.

With the bore and revolutions remaining constant, the power will vary directly as the length of the stroke, that is an engine with 8-inch stroke should develop twice as much as an engine with a 4-inch stroke. Of course, you realize that for the above statements to be true, all moving parts, ports, etc., must be correctly designed for the particular values of bore and stroke.

As to how far the stroke actually effects the real horsepower of the motor is really answered by the above paragraph. However, it would not hold beyond certain limits. That which determines the most economical stroke is the piston speed (2 x r.p.m. x stroke), as there is a certain correct value for this which must be determined in the design of every motor.]

Twin Screw Installations.

To the Editor of MoToR BoatinG, *Sir:*

We are interested in changing a steamer with 22 ft. beam, 105 ft. keel, draft 5 ft. from a side wheeler to a twin screw—and for best results, speed, and handling would like to know if the propellers should turn to the outside, that is, the port propeller turned to port and starboard propeller to starboard, or should they turn to the opposite; that is, the port propeller turned to the starboard and starboard to the port.

Carrabelle, Fla. G. T. C.

[Whether the propellers of a twin screw installation should turn inboard or outboard, this is a question over which many heated discussions have taken place and many costly experiments tried by the government, with the result that at the end they were exactly where they started. Everything seemed to indicate that there were as many points in favor of one as the other, from a speed standpoint. One thing is certain, however, that the maneuvering qualities of the boat will be a great deal better if the tops of the wheels turn outboard, than they would if they turned inboard. It is common practice on most motor boat installations to have the wheels turn outboard, probably for this very reason.]

New Things for Motor Boatmen

The Underwriter Valve.

The Underwriter Valve Company, of Providence, R. I., manufacture the Underwriter Valve, which is designed to be placed in the gasoline line, either at the carbureter or at the tank, or at both points. The valve, which is made of brass and copper throughout, is normally open, and is held against closing by the fusible link shown at the top of the valve. These links are a standard article, used in many other forms of fire protection devices, and are designed to melt at a temperature of 155 deg. Fahr.; in fact, the link is so sensitive that it can be fused by the flame from an ordinary match. Should fire break out, the resulting flame or heat melts the link before the fire can make much headway. The moment this occurs, a stiff spring, concealed in and protected by, the body of the device immediately closes the valve, shutting off all further flow of gasoline, while the remaining fire can usually be promptly extinguished. This fusible link, while open to the action of fire or heat, is well protected from external injury. There is no stuffing-box or gland to leak, the movement of the valve being controlled through a corrugated metal diaphragm. Should the link be melted from any cause, the valve can be put in use again in a few minutes by a piece of wire or even string to replace the link, but, of course, without the safety feature, and the makers will furnish new links for 10c each at any time. The insurance companies have given the valve their full endorsement. The valve sells for $5.00.

* * *

The Eaton Silencer.

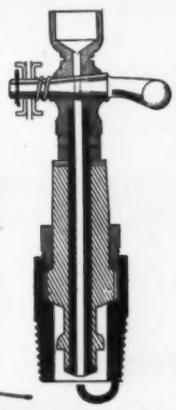
The Eaton silencer is constructed in such a way as to cause the gas to oscillate right and left through the blades and to collide through the holes, the result, it is claimed, being a silent exhaust without back pressure. Best quality grey iron is used for castings and the silencer may be used without water, although this is not recommended. To install the Eaton is a comparatively simple matter and its price ranges from $8 to $19, according to size. Extra blades and parts may be obtained at a small cost. The manufacturers are Eaton & Wilson, of New London, Conn.

* * *

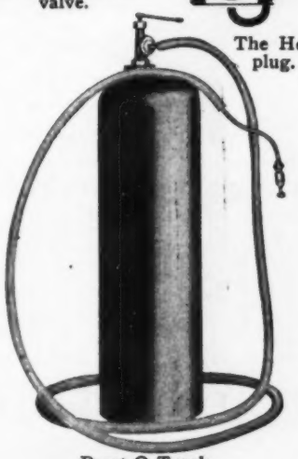
A Non-Explosive Can.

The McNutt Non-Explosive Can Co., of New York, specialize in garage cans fitted with a small safety device, which is so constructed that if there should be any unusual heat in the neighborhood of the can, the valve will not only release the excess internal pressure, but will cause a whistling sound as a warning. The seat of this valve is made of fusible steel so that in case of fire it will melt and be blown out of the can or tank. The device costs $2.

The Underwriter valve.



The Heco plug.



Prest-O-Torch.

The Eaton silencer.

The Heco Priming Spark Plug.

The Heco plug is designed with a cup head, which is intended as a gasoline receptacle. By pouring a little gasoline into this, having previously turned on the tap, the unpleasant job of starting up in cold weather is greatly facilitated, as the gasoline in passing through the plug, runs all around the sparking points, cleaning away any accumulation of carbon, and leaving a rich mixture right at the firing points.

The Heco costs $1.00 each, and is guaranteed by the manufacturers, the Heinze Electric Co., of Lowell, Mass.

* * *

The Prest-O-Torch.

This little device is intended to be used for soldering and brazing, in conjunction with any type of Prest-O-Lite tanks. Each torch has a volume sufficient for brazing up to 3/16-inch steel rods, but larger work may be handled by playing two or three torches on the same point. As the torch itself measures only 3½ by 2 inches, it is of handy size for small jobs in more or less inaccessible positions. It may be coupled close to the tanks or connected up with rubber tubing, which costs 10c per foot. It is particularly adapted for burning lead in storage batteries and costs 75c with two stem connections. The makers are the Prest-O-Lite Company, of Indianapolis, Ind.

* * *

The Automatic Speeder and Primer.

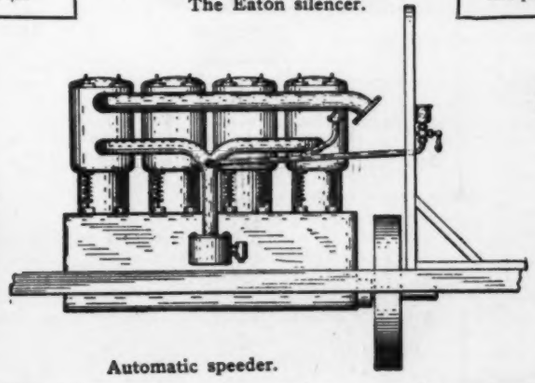
This is a device which might be termed an engine governor, as it is designed to automatically open when the motor attains a certain speed and to close as the engine speed reduces. The makers assert that its use saves a large percentage in gasoline; that it adds appreciably to the power of the engine, and, further, that carbon troubles may be completely eliminated by feeding a small amount of coal oil through the primer while the motor is running. The speeder can be fitted to any motor, and costs $5.00. It is made by the Motor Speeder Sales Company, of Toledo, Ohio.

* * *

Flexible Metal Hose.

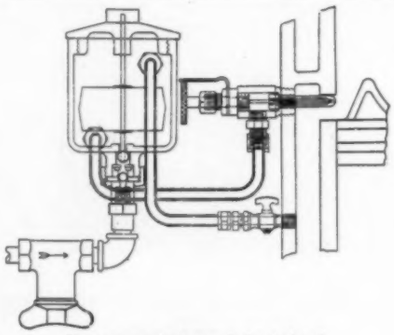
The Breeze Carburetor Co., of Newark, N. J., are manufacturers of various kinds of flexible metal hose. The semi-locked type is suitable for lighter pressure, such as air or oil or for electric wire covering and speaking tubes and a stronger gauge of weather-proof covering is suitable for heavier work. A special hose is made for gasoline. This is designed to stand 200 lbs. pressure and is guaranteed against leakage.

McNutt non-explosive can.

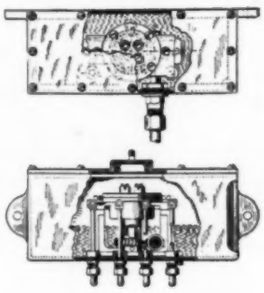


Automatic speeder.

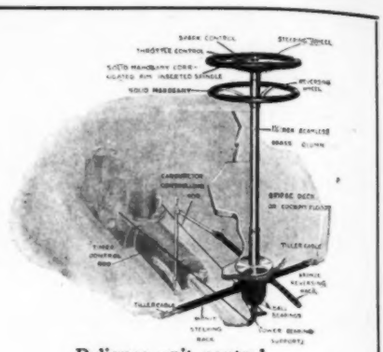
Breeze Co.'s flexible hose.



Bessemer balanced fuel feed.



Pedersen lubricator.



Reliance unit control.

Bessemer Balanced Fuel Feed.

The J. W. Lathrop Co., of Mystic, Conn., have placed a device known as the Bessemer balanced fuel feed, the use of which, it is claimed, enables an engine to be run perfectly on kerosene, gasoline or naphtha. It may be fitted to Lathrop or any other correctly-designed two-cycle engines, and it is stated that tests have shown that a boat can be driven about 20% farther on kerosene with this device than on gasoline used with a carbureter, while carbon deposits are less than before. Our illustrations show an engine with fuel feed fitted and also sectional view. The cost of the outfit is $20, or, with auxiliary float chamber, $5 extra.

* * *

The Detroit Heater.

The Detroit heater, although primarily designed for automobile use, is considered by its manufacturers to be specially suited for keeping cruiser cabins at a comfortable temperature during spring or fall weather. This heater differs somewhat from others of the exhaust-operated type, owing to the fact that the gases pass through the muffler, whether used or not, flexible steel tubing being used to conduct them from the exhaust line to the heater. The latter consists of an outer tube of wire mesh, which acts as a radiator and incloses an inner tube of corrugated sheet steel, which is connected up with the exhaust pipe heater valve by two flexible pipes. This valve, which is of butterfly type, allows free passage through the flexible tubing to the heater and from there back through the muffler from the other side of the valve. The outfit costs $14.50. The manufacturers are the Detroit Auto Heater Co., of Detroit, Mich.

* * *

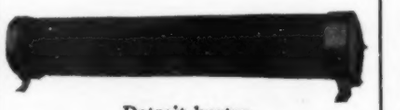
New Pedersen Mechanical Lubricator.

The Pedersen Lubricator is designed especially for motor boat use. It allows for a wide range of attachment, as it may be connected direct to any rotating shaft, placed either horizontally or vertically in the oil tank, or at a considerable distance, as the pump has strong suction and discharge power. In the face of the casing is a circular recess having openins forming inlet or suction ports. The pump is operated by rotating the shaft which carries the slidable piston which, acting upon the stationary pin, is given a transverse inward movement when opposite the inlet port, drawing in the oil. The manufacturers are the Pedersen Lubricator Company, of New York.

* * *

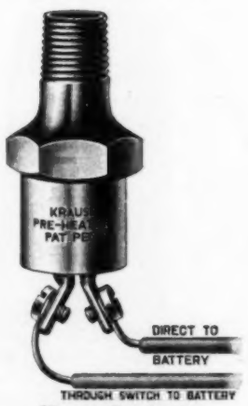
Krause Pre-Heater.

The Pre-Heater is an electrical device operated on a 6-volt current from a storage or dry cell battery. It is designed to heat the gasoline in the float chamber of a carbureter almost instantaneously and thereby facilitate starting in cold weather. It is said that recent experiments have proved the Pre-Heater enable an engine to be run satisfactorily on a mixture of gasoline and kerosene. The cost of the device is $3 and it is made by the Krause Manufacturing Co., of Detroit, Mich.

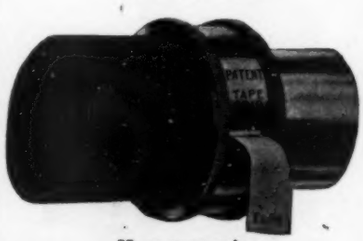


Detroit heater.

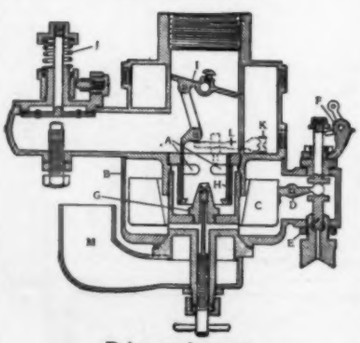
Nicholson coil file.



Krause Pre-heater.



Herz tape grip.



Price carbureter.

Reliance Unit Control.

The new cruiser control manufactured by the Hall-Gibson Co., of Rochester, N. Y., is designed to place the complete control of the boat right at the pilot's finger tips. The upper or pilot wheel actuates the lower rack, running athwartship, which is connected at each end with the steering control. The lower or reversing wheel actuates the upper rack, running fore and aft, which is connected with a link to the reverse gear and the turning of this wheel operates the engine-reversing mechanism. Centrally located within the steering wheel is mounted a nine-inch quadrant with two levers, containing smooth spring drags, which insure the two controlling levers remaining in their positions until they are through the cranks at the lower end of the carbureter and timer. The wheel rims are of solid mahogany, the upper one 18 inches in diameter and the lower 17 inches. The remainder of the outfit is of seamless brass tube and manganese bronze, and all pinions, wheels, etc., are securely keyed. Ball bearings are fitted between the two pinions and cage, to eliminate friction and prolong the life of the gear.

* * *

The Nicholson Coil File.

The Nicholson File Company, of Providence, R. I., have added a new specialty to their general line of files, already comprising over 3,000 varieties. This is in the form of a coil file, made especially for the purpose of keeping ignition in good shape. Yachtsmen who know the troubles coming from corroded contact points in their coils, vibrators, or spark plugs, will find this little file very useful and convenient, and a welcome addition to the kit. These files cost $1.50 per dozen, in a box.

* * *

Cupror.

The L. C. Smith Co., of Bridgeport, Conn., manufacture Cupror, a metal, which, when buffed up, is said to possess the lustre of polished gold, and is consequently suitable for marine usage, such as for motor boat fittings, etc. It is claimed that Cupror will not corrode; can be kept clean and bright with little labor; is not affected by sea water or air, and occasional wiping with a cloth is all that is necessary to maintain its brilliancy. If allowed to become coated with deposit it only needs washing with soap and water. Cupror is sold in ingot castings, forgings, sheet rod and wire, and is highly malleable, having a very high tensile strength, tests showing the rod to have a strength of 93,000 lbs. and the wire, 20 B. & S. gauge, 138,500 lbs. to the square inch. Cupror metal spins and draws readily, having the requisite tenacity or toughness with ductility, and needing neither lacquer nor plating.

* * *

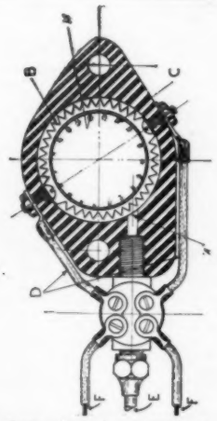
"Six Little Yankees."

Is the title of a non-liquid preparation designed to remove carbon deposits from engine combustion chambers without the usual scraping. The manufacturers, The Six Little Yankees' Co., of Philadelphia, Pa., say it contains no harmful ingredients, explosive or otherwise. Sufficient for three cleanings of a four-cylinder motor or two cleanings of a "six" packed in a box costs $2.

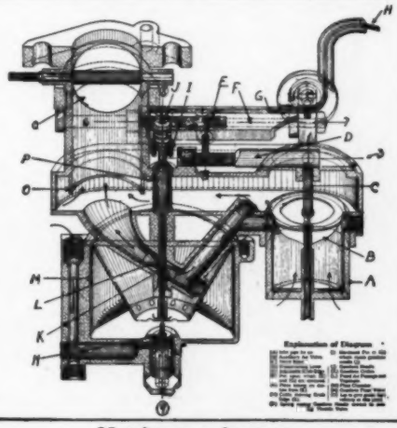
* * *

The Herz Tape Grip.

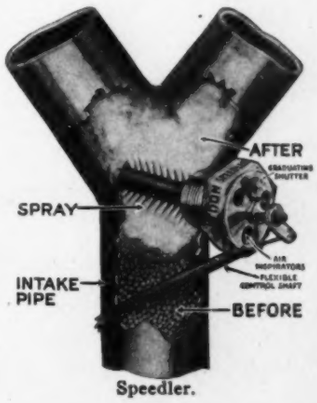
The Herz tape grip consists of a metal rim



Tate electric vaporizer.



Motsinger carbureter.



Speedler.

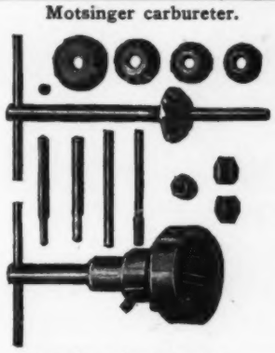
The Fosnacht Valve Reseater.

This implement consists of a large cutter designed to fit all sizes of 45° valves and five sizes of seat cutters ranging from 1½ to 2¼ inches which are made of tempered carbon steel, the valve cutter having inserted blades which can be readily removed and resharpened. The Fosnacht is made by the National Auto Specialty Co., of Tama, Iowa, and is sold at $30.

* * *

An Electric Vaporizer.

The Tate electric vaporizer consists of a small electrical resistance coil which is used to vaporize the gasoline. It is stated that five amperes of current from any ordinary six volt battery is sufficient to fill the intake manifold with a hot gasoline vapor in about six seconds. Gasoline is fed to the heating coil through a small pipe from the carbureter line, the device being put in operation by a switch on the bulkhead, which in turning on the current opens an admission valve controlled by an electric magnet inserted in the heater circuit. The device is being handled by the United Motor Equipment Co., of Chicago, Ill.



Fosnacht valve reseater.

The Motsinger Carbureter

To enumerate the many claims for perfect service made for the new production of the Motsinger Device Manufacturing Co., of La-Fayette, Ind., and give the constructional details which effect such service is unfortunately impossible in the space at our disposal. Accordingly it must suffice to say that the Motsinger carbureter has been developed mathematically and is without adjustments except for change of fuel or extreme weather conditions and this is controlled from the bulkhead. The carbureter is claimed to give a perfect proportional mixture of gasoline and air under all variations of motor conditions, and more mileage out of low grade, cheap gasoline than is obtained from high grade, expensive gasoline. This, of course, is possible if the preceding claim be realized as the lower grade fuels approaching kerosene have a greater number of heat units per pound than higher test gasoline.

Speedler.

Speedler is a device designed for the purpose of remixing, revaporizing and breaking up the gasoline particles after their passage through the carbureter and to afford a constant correct proportion of air. It is composed of three parts, the controller which is attached to the bulkhead, the sprayler which screws into the manifold, and the flexible connection. The air spray stem of the sprayler should, when fitted, reach as nearly as possible across the current of the mixture. These stems are made in various lengths to insure their fitting different diameters of intake pipe. The "cross-cutting" feature of the spray should be noted as to this is attributed the efficiency of the device, which costs $5 and is made by the Lydon Mfg. Co., of Chicago, Ill.

Boats of Stock Design.

A New Design Nantucket Dory.

THE Lamb Engine Co., of New York, have designed their Nantucket dory with a view to combining the seaworthy qualities for which these boats are so justly famed with such modifications as were necessary to permit the use of an engine without in any way detracting from all around efficiency. The specifications of the Nantucket dory are: length overall, 16 feet; length water line, 14 feet 8 inches; beam 4 feet 8 inches; draft, 16 inches. Timbers are of white oak, 1¼" x 1¼" steam bent, spaced 12 inches on centers extending in one length from gunwale to gunwale. Planking is ⅝ inch clear cedar, fastened with best galvanized boat nails to each timber. The keel is 1¼ inch white oak with galvanized bolts and rabbetted to receive planking. Stem and stern are of heavy white oak securely fastened and braced to keel, with natural crook white oak knees. The decks are of selected ⅝ inch cypress, laid in 2 inch strips and caulked. The coaming is of quartered oak, finished ½ inch. After the dory has been smoothed up and sandpapered, it is thoroughly finished with Anti-Fouling and white lead. Decks, coamings, mouldings and all trim are finished with three coats best spar varnish, and the interior of cockpit is given two coats of French grey. The sterling wheel, rudder and tiller are of galvanized iron. The power plant consists of a Fulton self-sparking engine rated at 3½-4 h.p., but having a bore of 3¾" x 4" stroke, and developing considerably more than its rated horsepower. A Koven cylindrical galvanized tank is located under the forward deck. The price of the dory complete is $250, f.o.b. City Island, N. Y.

Lamb Engine Co.'s Nantucket dory.

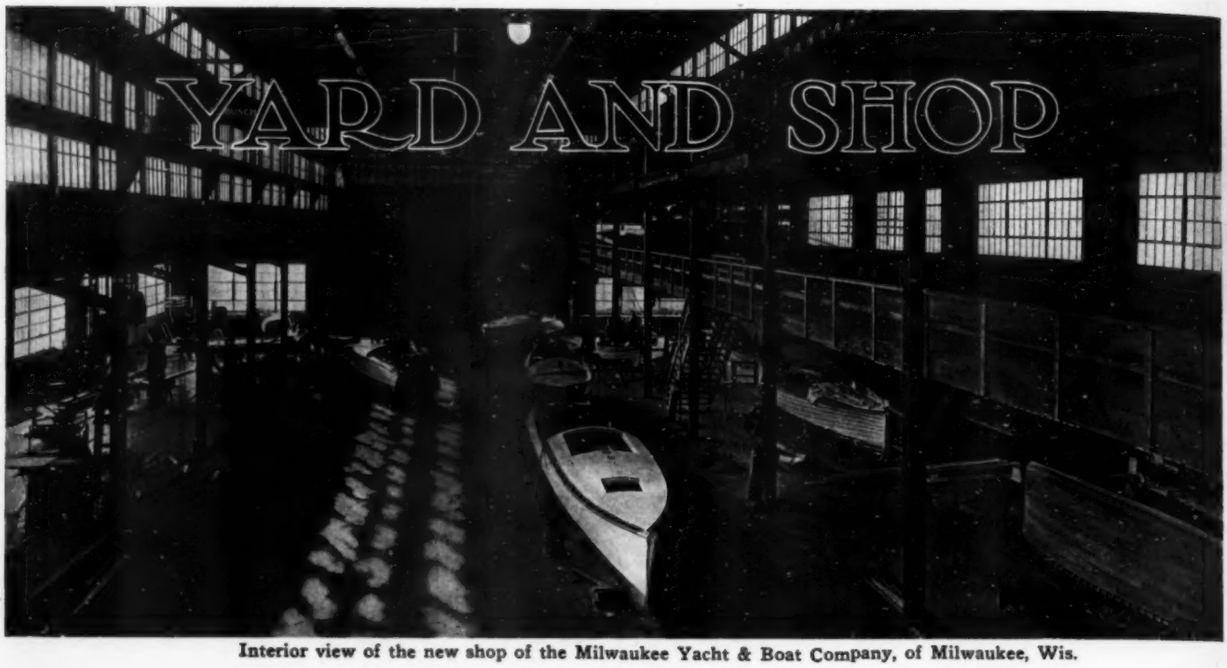
The Mullins Hydroplane.

THIS craft is the latest production of the W. H. Mullins Company, of Salem, O. She is equipped with a 25 h.p., three cylinder two cycle Pierce-Budd engine, equipped with Bosch high tension magneto and Joe's clutch. Her dimensions are: length 16 feet overall, width 4 feet two inches, depth at stern 17 inches. The guaranteed speed is 28 miles per hour and the price is $1,000. The lines upon which the hydroplane is constructed indicate that she trims nicely when at speed and causes very little disturbance.

The Mullins Company are well known as specialists in the adoption of pressed steel to the construction of boats of all types and sizes. A special grade of steel, which is twice galvanized, is used and in addition an exclusive process is employed which is designed to prevent the galvanizing scaling in use. It should be noted that the steel plates are drop pressed between steel dies of mathematically correct section, thereby insuring absolute accuracy of contour and fitting. Full sized wax models of each design are made in the first instance.

W. H. Mullins Co.'s hydroplane.

YARD AND SHOP



Interior view of the new shop of the Milwaukee Yacht & Boat Company, of Milwaukee, Wis.

Johnson Reverse Gear.

J. W. M. Wheeler, of Elyria, may claim the honor of being one of America's most distinguished long distance motor boatmen. He spends much of the summer season in long distance cruising, earning his living meanwhile, by demonstrating motor boat equipment. Last summer he traveled 2,000 miles, when an accident compelled him to return home and give up the rest of his contemplated trip.

Last June, just before he started on his long trip, Mr. Wheeler installed on his boat a No. 1 Johnson marine reverse gear, manufactured by the Carlyle Johnson Machine Company of Manchester, Conn. It was understood at the time that the reverse gear was intended for use with a 12 h.p. motor at 500 to 700 r.p.m. At the last moment, however, Mr. Wheeler installed a 3 cylinder 18 h.p. motor, but used the No. 1 gear with it. It was rather a cool proposition to ask the No. 1 gear to hold the 18 h.p. motor, a larger size than it was built to go with, but Mr. Wheeler writes:—"The gear held it all right. It had about 2,000 miles of running and never showed a sign of slipping."

The Carlyle Johnson Company attribute their gear's ability to assimilate more than its fair share of work, to the fact that they use chrome-vanadium steel in the gear and shaft. It is claimed that this steel has greater "toughness" than ordinary machinery steel and yet weighs less and takes up less space by a considerable percentage.

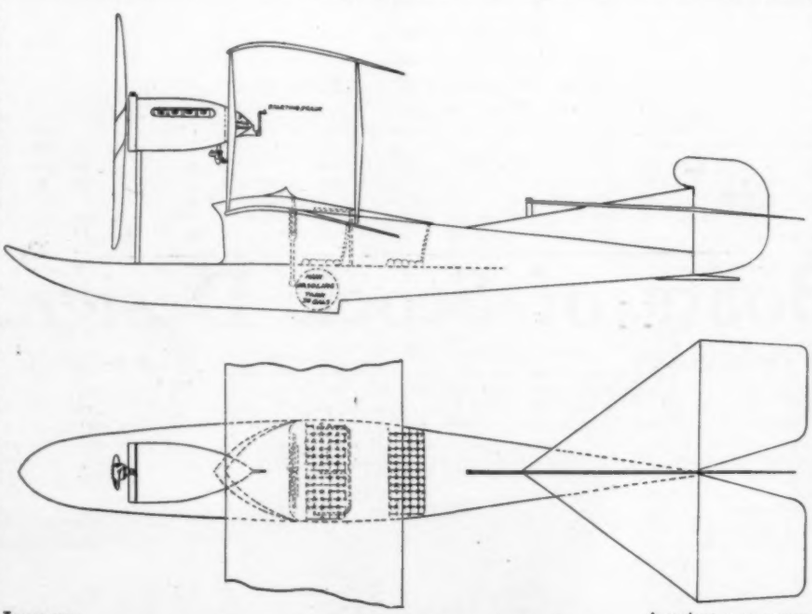
Michigan Wheel Co.'s Increase.

The Michigan Wheel Company, of Grand Rapids, Mich., reports that its orders for 1913 have largely increased over the showing of previous years. Even so early in the season as this a night gang has been put on, and by working steadily for the 24 hours they have been enabled to keep up with the demands for their reverse gears, propeller wheels and other motor boat supplies.

Milwaukee Yacht & Boat Co.'s New Home.

The Milwaukee Yacht & Boat Company has recently moved into the handsome new quarters pictured on this page. This new plant is located on the Kinnickinnic River, about half a mile from Lake Michigan, giving plenty of room for expansion. The main shop is of steel, tile and concrete construction and has about 20,000 feet of floor space. The shop is so built that the raw material enters at one side and passes from process to process, emerging a finished product at the other end of the building. Another interesting feature of this notable plant is a marine railway capable of handling a vessel of 200 tons displacement. The equipment of the entire plant is believed to be unusually complete and includes hoisting machines, cranes and all the innumerable adjuncts to modern boat building.

The offices of the company are located on the second floor of the main building, and give the visitor an impression of carefully worked out arrangement. The officers of the Milwaukee Yacht & Boat Company are: James B. Welch, president; F. W. Magin, vice-president; A. W. Crouch, secretary, and C. G. Welch, treasurer. Mr. Crouch is in charge of the designing department.



Curtiss flying boat, specially designed for Harold F. McCormick, of Chicago. Note position of motor.

Plant of the Ferro Machine and Foundry Company, at Cleveland, Ohio.

Inimical Legislation.

There is now pending before the Legislature at Albany the Farrell bill, for the control and regulation of motor boats on waters under the jurisdiction of the State of New York. Certain provisions of this measure seem to be particularly inimical to motor boating as a sport and a business, for commercial motor boats are required to carry licensed officers. Motor boating organizations are urged to obtain copies of the measure from D. W. Peck, superintendent of public works at Albany, and bring the matter before their members, so that united effort may be directed against the hostile portions of this proposed law.

New Pickering Boat.

An interesting 160-footer is now in course of designing by H. B. Pickering & Co. The power plant of this new cruiser is to consist of two oil-burning turbines and a Diesel. The design of this vessel will appear in the June issue of Motor Boating.

Mixing Borneo and Brazil.

A curious error occurred in our April issue, through the loss of a picture and the use of a wrong caption with another. Under a picture of a boat called "Perfection," which was shown in a tropical setting, we said that she was built by the Fay & Bowen Engine Company for service in Brazil. As a matter of fact the staunch little craft is a native of Borneo, where she is doing excellent service in passenger carrying, with the help of a 4-cylinder, 30 H. P. Caille Perfection motor, and her owners have no intention of letting her get away to Brazil.

We are also showing on page 43 a picture of the handsome little motor craft that was recently completed by the Fay & Bowen Engine Company for their Brazilian client. This boat was designed by Morris M. Whittaker, is 33 feet long, has 7-foot beam, and is driven by a Fay & Bowen 30-45 H. P., 4-cycle, 4-cylinder engine. The Fay & Bowen company tell us that the boat made 14¾ miles per hour on a test in Seneca

The new Esterline factory on South Street, Indianapolis, Indiana.

Lake one winter morning, when the thermometer the previous night had registered 14 below zero. A peculiarity of Seneca Lake is that it seldom freezes, but is open when all the other lakes of Central New York state are frozen up tight. This fact is of much service to the Fay & Bowen company, since their testing "ground" at Geneva is open to them practically all winter.

Two Sterling Sportsmen.

Two Canadian motor boat sportsmen are preparing to invade the States this summer and give their neighbors across the border a merry chase for speed honors in the several big regattas of the season. Two new hydroplanes have just been ordered from Montreal, and both, it is claimed, will have a guaranteed speed of 50 miles per hour. Jean Versailles, the motor boat enthusiast, will drive a 26-foot hydro of Hacker design in the Gold Challenge Cup Race, Buffalo regatta and the 100-mile Lake St. Louis endurance run. He is installing an 8-cylinder, 150-180 H. P. Sterling racing engine, and expects to make American contenders hustle.

Not to be outdone by his fellow townsman, E. J. Luther, has just placed his order for a 26-foot hydro, also to be driven by an 8-cylinder, 150-180 H. P. Sterling engine and designed by Hacker, of Detroit. Mr. Luther also plans to cross the border and race his boat in American regattas.

Fulton Gets Contract.

The Fulton Manufacturing Company, of Erie, Pa., informs us that it has just been awarded a contract by the water commissioners of Erie for a 36-foot service boat to be used for carrying workmen and supplies. This boat is to be equipped with a 15 H. P. self-sparking engine with a kerosene burner, and which carries a speed guarantee of 10 miles per hour.

A Visit to the Durkee Plant.

Recently some of the old customers of Chas. D. Durkee & Co., manufacturers and distributors of marine hardware, expressed a desire to see the whole of the extensive plant. Mr. Durkee very good naturedly consented to cicerone the party, which first made a complete tour of the great warehouse on South street, New York City, and later went through the manufacturing plant, including machine shop, brass, aluminum and gray iron foundry at Grasmere, Staten Island.

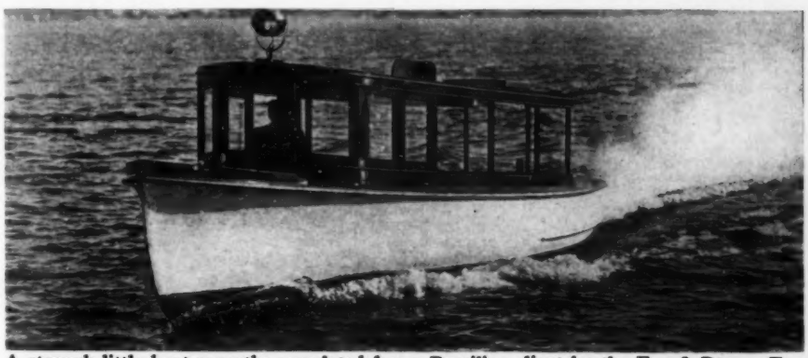
When the trip was over one of the visitors jokingly asked Mr. Durkee whether there was anything under the sun that he didn't sell. The reply was that the Durkee line comprised practically everything a motor boatman could need except eatables, drinkables, the motor itself and its fuel. He further mentioned that reverse gears, complete ignition equipment, lubricants, lubricating devices, carbureters, mufflers, piping and tanks were included in their daily sales.

In the course of his talk Mr. Durkee, pointing out his company's full stock of fire extinguishing apparatus, mentioned that many motor boatmen did not seem to realize the fact that the Federal laws compel every motor craft to be equipped with paraphernalia for extinguishing gasoline fires. Failure to comply with this statute renders the motor boat owner liable to severe penalties. "I suppose," went on Mr. Durkee, with a smile, "that I need not refer to the need for life preservers on motor craft, but it may not be amiss to call attention to the fact that such equipment at this time of the year needs a thorough inspection to see that it is still up to the mark." This last is a remarkably useful thing to remember at this season of the year, when fitting out is in full swing.

New Naval School.

By a recent judicial decision the Massachusetts Institute of Technology is assured of the funds necessary to establish the Pratt School of Naval Architecture and Marine Engineering. This money comes under a will which provides that the work may proceed when the funds amount to three-quarters of a million dollars, which amount is now practically in hand. In this way the institute will be enabled to extend the scope of its marine engineering department, which is already well known in naval circles. Every naval constructor graduating from Annapolis goes to the institute to complete his courses, and the number of students from foreign countries studying in the Massachusetts school is constantly increasing.

"Meteor," a passenger launch, 32 feet 6 inches long. Equipped with an 18-25-h.p. Sterling engine; she can do 14 miles per hour.



A staunch little boat recently completed for a Brazilian client by the Fay & Bowen Engine Company.

This power boat, which was shown last month over an erroneous caption, is a native of Borneo and is powered with a 30-h.p. Caille Perfection motor.

New Gas Engine Launch.

The Gas Engine and Power Company and Chas. L. Seabury & Co., of Morris Heights, N. Y., have just turned out a very interesting little boat in the shape of a shallow draft gasoline launch named "Yasica." The Cuba Planters Company, of New York, are the purchasers, and the boat is intended for use at their plantations in San Domingo, where she will be employed in towing flat boats loaded with bananas. The "Yasica" is intended for use in very shallow water, and is of tunnel stern type, fitted with a twin screw. The dimensions of the boat are 32 feet length, 9-foot beam, 18-inch draft, and the guaranteed speed is 10 miles per hour, although the builders tell us that more than 11 miles was turned up at the trial.

The power plant is located amidship, with sliding hatch arranged to prevent water from getting into the motor during the rainy season. The machinery consists of two 4-cylinder, 4½-inch bore by 5-inch stroke, 4-cycle Speedway gasoline engines with Bosch dual ignition, MeCord forced feed oiling system, etc. The controls to the motor are located at the after end of the sliding hatch, bringing the control of the motors readily accessible to the engineer.

New Esterline Factory.

The Esterline Company has recently moved from Lafayette, Ind., into a commodious new factory built for it on South street, Indianapolis. Here will be manufactured the Golden Glow electric lamps for motor boats, etc. The Esterline electric starting and lighting system will also be turned out from this plant. In the fall the Lafayette factory will be merged with the Indianapolis plant.

Mr. W. T. Wheeler and Commodore Lagen, of the Yachtsman's Club of Philadelphia, at the launching of Tec, owned by Mr. Wheeler and built by the Ruddock Boat Works, as an entrant for the Bermuda Race.

"Champion of Asia."

Word has recently been received from Manila, P. I., of the defeat of the former champion motor boat of Asiatic waters by the Cloverleaf. This new speed demon is a 35-foot runabout, designed by John L. Hacker. She is powered with a 6-cylinder, 100 H. P. Van Blerck motor. Her owner, H. L. Heath, expects to pit his boat against the pick of Asiatic motor craft on July 4, to give them another chance for premier honors.

* * *

Trade Literature Received

Hall-Gibson Catalogue.

The Hall-Gibson Company, of Rochester, N. Y., is out with a new catalogue covering its line of steering gears. The slogan on the outside of this publication "A Wheel for Every Type of Boat," is certainly borne out by the contents and in its pages the motor boatman can undoubtedly find the gear exactly suited to his craft.

Dayton Lighting Outfits.

The Dayton Electrical Mfg. Co., of Dayton, Ohio, sends us its new catalogue, which includes pictures and descriptions of every form of electric lighting and ignition equipment for motor craft of every type.

Pope Boats.

The Pope Boat Company, of Fond du Lac, Wis., is issuing a new catalogue covering its line of water craft of every description. An attractive innovation in catalogue making is introduced by having the publication in the form of a portfolio, the leaves unbound. Ample descriptions of all this company's products are given with numerous, excellent illustrations. In addition this concern is sending out a very nice little catalogue of its line of "knock down" boats in a variety of types, from the little speed craft to the big cruiser.

Bridgeport Motors.

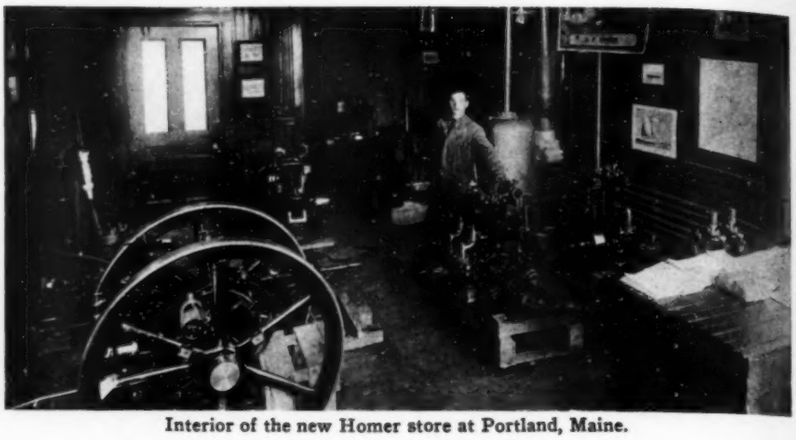
The Bridgeport Motor Company, of Bridgeport, Conn., has forwarded to us a copy of their 1913 catalogue. The booklet starts with a general description of Bridgeport methods of construction and then follow a very satisfactory series of descriptions of individual motors, fully illustrated.

Fay & Bowen Catalogue.

The Fay & Bowen Engine Co., of Geneva, N. Y., is issuing a very nice catalogue for 1913. The publication covers this company's entire line of boats and engines. It contains exhaustive descriptions of parts and assembled products, copiously illustrated in halftone and line. Altogether it is a very creditable example of catalogue making.

Scripps Detroit in Spanish.

While we cannot vouch for the Castillian purity of the language in the Scripps Detroit Spanish catalogue, which has been forwarded to this office, we believe it may safely be assumed to be on a par with the general excellence of this little booklet's get-up, which we have already noted as regards the English edition of this same publication.



Interior of the new Homer store at Portland, Maine.

The Bosch News.

The Bosch Magneto Co. has kindly forwarded to us an advance copy of the March number of the Bosch News. There are some very interesting articles in this little booklet and one couched in semi-technical language, on a new Bosch magneto, is worthy of special notice.

Elco Catalogue.

The Elco people, of Bayonne, N. J., are issuing a very handsome catalogue covering their 1913 line, which includes types to satisfy the demands of every class of motor boatmen. The choice ranges from the little Elcoplane, built purely for speed to the commodious motor yacht ninety-eight feet in length. The catologue contains very full descriptions of all the boats and is copiously illustrated.

An interesting view of a busy corner of the work-shop of the Baldridge Gear Company at Detroit, Mich.

Eagle Engines.

The Standard Company, of Torrington, Conn., sends us its catalogue covering the Eagle line of marine engines. There are motors described herein, for all sorts of purposes and there is also a list of ignition accessories. The booklet is amply illustrated.

Lackawanna Booklet.

The Lackawanna Mfg. Co., of Ballston Spa, N. Y., is issuing a very satisfactory little catalogue of its 1913 line. The endeavor has been to give the reader a concise but full description, in simple language, of each size and type of motor. The booklet is very fully illustrated and sectional drawings help materially to make the subject matter illuminative.

The Moore Switch.

J. B. Moore, manufacturer of the Moore reverse switch, informs us that he has just issued the third 5,000 edition of his Moore Reverse Switch Booklet.

Morss Catalogue.

The A. S. Morss Co., of Boston, Mass., is issuing an exhaustive catalogue covering its 1913 accessory line. An interesting feature of this year's catalogue is the discount list, giving prices on the entire line. The list of accessories includes practically every product needed for the motor boat.

Hodgson Houses.

The E. F. Hodgson Co., of Boston, Mass., sends us a very neat booklet covering its line of portable houses. The connection between these ready made summer homes and the motor boat is readily apparent and the combination of the two spells "Ideal Vacation."

Navalite Booklet.

The Chicago Varnish Company is issuing a very nice little booklet descriptive of their marine varnish known as "Navalite." In addition to giving full information as to the uses to which the product may be put, its properties, virtues, etc., there is given a collection of letters from actual users, telling of their experiences.

Crocket Spar Composition.

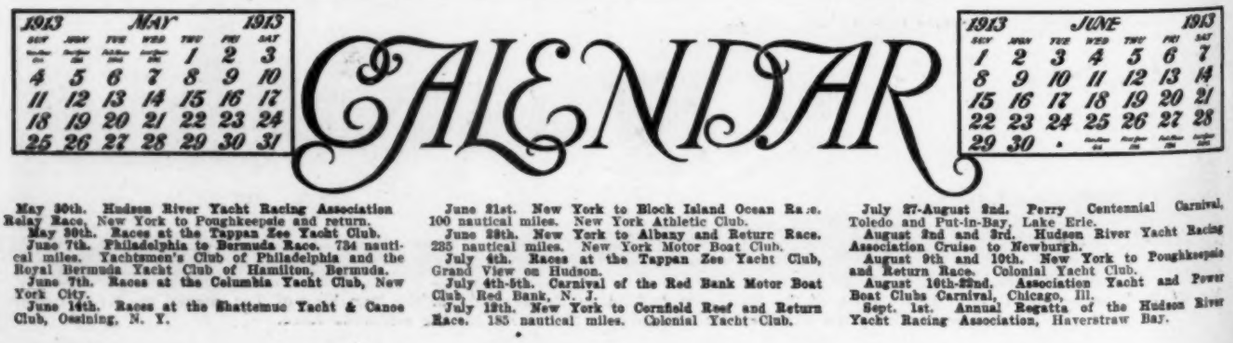
The David B. Crockett Co., of Bridgeport, Ct., is issuing a very full catalogue covering its Spar Composition and other marine varnish specialties. The No. 1 Preservative for interior cabin work and the waterproof floor finish for cabin floors are fully described, with methods of application. The motor boatman who understands the necessity for getting varnishes that are made to meet the conditions encountered in marine work, will be deeply interested in this Crockett catalogue, which in itself is a very creditable piece of booklet making.

Auto Craft Catalogue.

The Cleveland Auto Boat Mfg. Co., of Cleveland, Ohio, sends us its 1913 catalogue of Auto Craft Launches. There are full descriptions of this interesting line of small boats and a supplementary list of motor boat accessories. The booklet is copiously illustrated.

Chas. Miller Catalogue.

The new Miller catalogue is in our hands. Between the colored covers of this publication, the motor boatman will find every imaginable accessory to make pleasant "life on the ocean wave." There are 256 pages and every page is filled with things to make the enthusiast happy. As usual, the Miller catalogue is copiously and satisfactorily illustrated.



May 30th. Hudson River Yacht Racing Association Relay Race, New York to Poughkeepsie and return.

May 30th. Races at the Tappan Zee Yacht Club.

June 7th. Philadelphia to Bermuda Race. 734 nautical miles. Yachtsmen's Club of Philadelphia and the Royal Bermuda Yacht Club of Hamilton, Bermuda.

June 7th. Races at the Columbia Yacht Club, New York City.

June 14th. Races at the Shattemuc Yacht & Canoe Club, Ossining, N. Y.

June 21st. New York to Block Island Ocean Race. 100 nautical miles. New York Athletic Club.

June 28th. New York to Albany and Return Race. 235 nautical miles. New York Motor Boat Club.

July 4th. Races at the Tappan Zee Yacht Club, Grand View on Hudson.

July 4th-5th. Carnival of the Red Bank Motor Boat Club, Red Bank, N. J.

July 12th. New York to Cornfield Reef and Return Race. 185 nautical miles. Colonial Yacht Club.

July 27-August 2nd. Perry Centennial Carnival, Toledo and Put-in-Bay, Lake Erie.

August 2nd and 3rd. Hudson River Yacht Racing Association Cruise to Newburgh.

August 9th and 10th. New York to Poughkeepsie and Return Race. Colonial Yacht Club.

August 16th-22nd. Association Yacht and Power Boat Clubs Carnival, Chicago, Ill.

Sept. 1st. Annual Regatta of the Hudson River Yacht Racing Association, Haverstraw Bay.

MOTOR BOATING ADVERTISING INDEX

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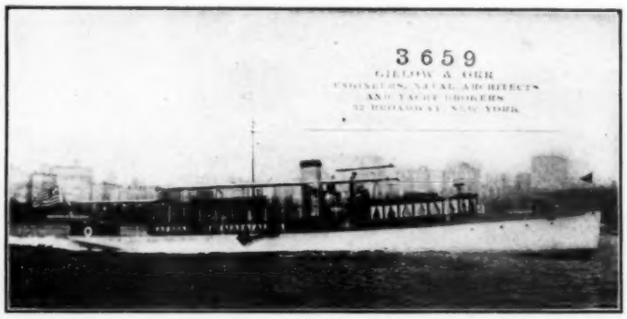
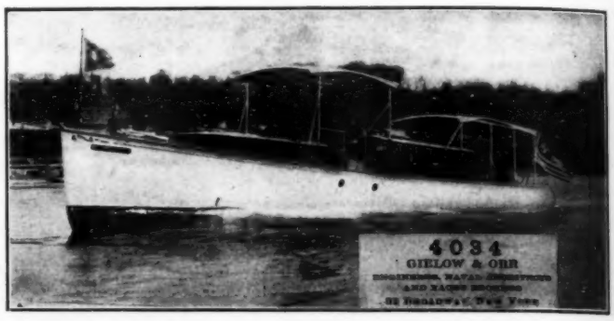
As there are upwards of 3,000 yachts in our list, we can furnish you with exactly what you want, whatever the type, size, cost, equipment or class of service you have in mind. We publish no book of these, because our list is so large and constantly changing, but we will promptly submit photographs and full information on all suitable boats on the market, if you mention your requirements.

Our long experience as architects and engineers lends an added value to our brokage service, in expert appraisal and advice, estimates and supervision on alterations, etc.



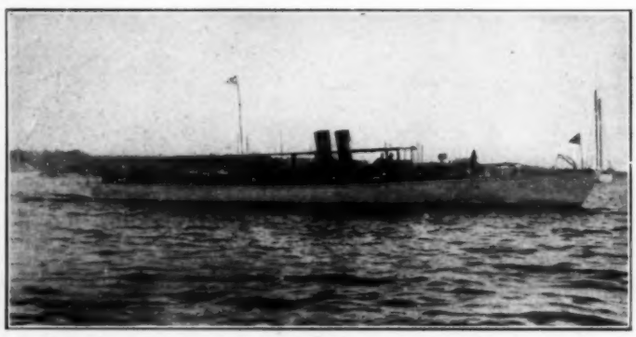
No. 3659.—Sale.—99 ft. x 14 ft. x 4 ft. 6 in.; twin-screw; 18 miles; unusually comfortable.

Please mention MOTOR BOATING.



No. 4034.—Sale.—Modern 50 ft. x 8 ft. x 3 ft. high-class day cruiser; 18-19 miles. Built 1911.

Please mention MOTOR BOATING.



No. 3448.—Bargain.—111 ft.; twin-screw; express type; speed up to 19 knots.

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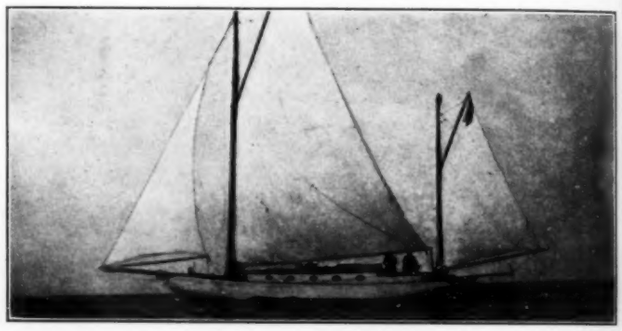
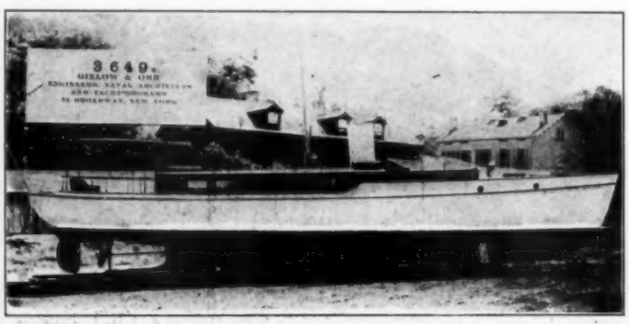


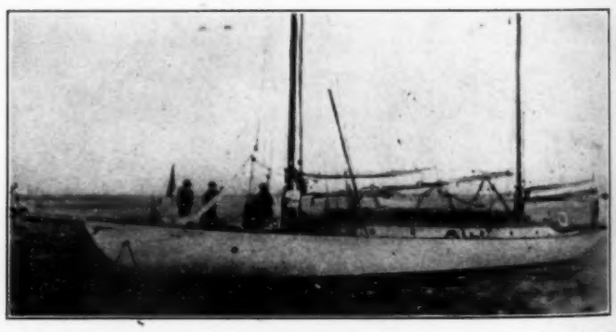
No. 2248.—Bargain.—C. B. auxiliary yawl, 48 ft. x 32 ft. x 12 ft. 6 in. x 5 ft; Murray & Tregurtha engine; fine seaboat.

Please mention MOTOR BOATING.



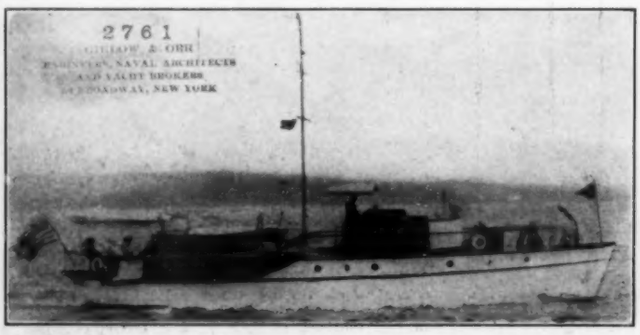
No. 3649.—Sale.—53 ft. x 11 ft. x 3 ft. 6 in; built by Lawley, Fall 1911; new 20th Century 6 cyl. motor; perfect condition; nothing better available.

Please mention MOTOR BOATING.



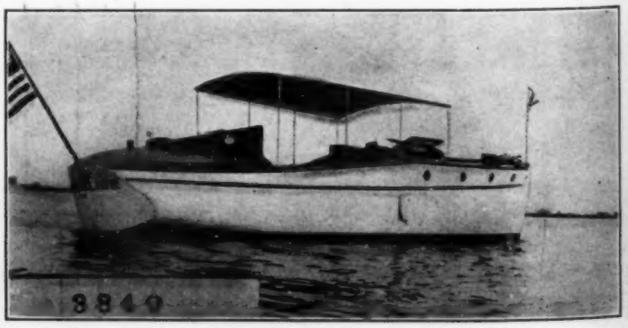
No. 3534.—Sale.—Auxiliary ketch, 88 ft. x 64 ft. x 17 ft. x 4 ft. 2 in. draft; built 1910; Standard engine.

Please mention MOTOR BOATING.



No. 2761.—Sale, Charter.—Low price; twin-screw; 62 ft. x 11 ft. x 4 ft.; 20th Century motors.

Please mention MOTOR BOATING.



No. 3849.—Sale.—36 ft. x 9 ft. 6 in. x 2 ft. 10 in.; built Fall 1911; Holmes' 4 cyl. motor, 25 H. P.; roomy; seaworthy; best construction and finish.

Please mention MOTOR BOATING.

THE MOTOR BOATING MARKET PLACE

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Opportunities for the Motor Boatman

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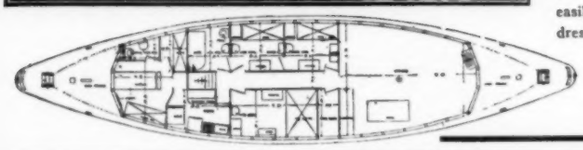
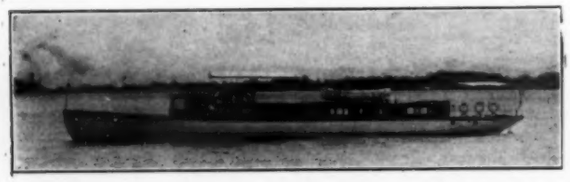


FOR SALE OR CHARTER.

CRUISING HOUSEBOAT.

80 feet long x 18 feet beam, practically new. Has all the conveniences of a city apartment — running water and acetylene gas in all staterooms — large saloon and promenade under awnings. Has far more accommodations and comfort than a yacht twice the size. Very easily and economically handled. Address Box 80, Motor Boating.



96 ft. Cruiser—For Sale.

Mahogany cabins, complete equipment of best quality. Large galley, very roomy stateroom, carpets, upholstery, curtains best. Boat good as new, having been kept in boat house. Carries power and rowing dinghy. Liberal free board. Very seaworthy and fast. Triple screw, three 50 H. P. motors, all independent. Low price for quick sale. Big powerful electric light plant and storage batteries. Independent motor.

O. J. Mulford, 83 Fort St., West Detroit, Mich.

FOR SALE—Nearly new, 32 x 8.8 ft. raised deck cruiser, one man control, upper construction all mahogany; complete Fay & Bowen engines and outfit; for salt water. Electric lights, etc. Dr. J. A. Spengler, Geneva, N. Y.

FOR SALE—Fast runabout, 26 x 5 ft.; speed 18 miles per hour; 30 H. P. Loew-Victor engine; auto steering wheel and controls, glass spray shield; built of select juniper; brass and galvanized fastenings; finished in natural wood; boat and engine in fine condition; price $700. R. T. Gallagher, Washington, North Carolina.

FOR SALE OR TRADE.—Open launch 27 ft. x 5 ft.; 1912 30 H. P. 4 cyl. Mercury; canvas top; open launch, 22 ft. x 4 ft. 6 H. P. Lackawanna. Would consider trade on raised deck cruiser about 30 ft. x 8 ft. Geo. Washburn, Jr., Catskill, N. Y.

BROKEN cylinders and crank cases welded. Worn cylinders rebored. Scored cylinders repaired, $12. See our ad, Page 126. Waterbury Welding Company, Waterbury, Conn.

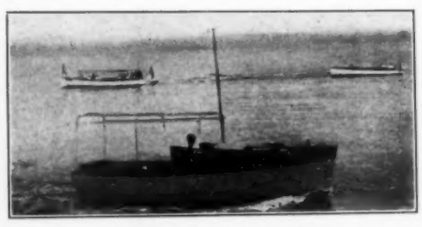
CYLINDERS REBORED—Pistons and rings fitted, new cranks, connecting rods, cases, transmissions, any part for automobile or motor boat motor reproduced like original. Gear cutting of all kinds and materials. Send old part. The shop of quality. McCadden Machine Works, Minneapolis, Minn.

AUTOMOBILES.

AUTOMOBILE, Marine, Motorcycle Cylinders reground new pistons and rings fitted. Makes engine equal to new. Write for particulars. Cast Iron Brazing Co Manchester, N. H.

FOR SALE—Motor Boat "EMITA," 28 ft. long by 4½ ft. wide, equipped with 12 H.P. Fairbanks-Morse, Baldridge Reverse Gear, C. A. V. High Tension Magneto, N. Y. C. Dashboard Coil, P. & R. Storage Battery, Flags and Flag Poles, Anchors, etc. Speed 12 miles an hour, Seaworthy and good family launch, in first-class order. Hull built of Cedar and Pine, Decks of Oak and inside of Mahogany. Round Stern and Bow. Apply to N. Asselin, Secretary-Treasurer, The St. Maurice River Boom & Driving Co., Ltd., P. O. Box No. 3. Three Rivers, P. Q.

A RELIANCE BARGAIN—For Sale—Fast service mahogany runabout, 28 ft., o. a.; 4 ft. 3 in. beam, built by Reliance Boat Company, 40-50 1911 Continental engine, has not been run 300 miles; conservative speed 21 miles per hour; equipment complete to last detail. Boat like new; cost $3,400, will sell for $1,500. Can be seen by appointment. F. R. King, Room 502, 1493 Broadway, New York City.



NO. 2152.—For Sale.—Raised deck cruiser; 18.9 x 6 x 1.4 ft. draft; built 1911; 4-5 H. P. Bridgeport motor; 2 berths in cabin; complete equipment; in first-class condition; low price. Apply to Cox & Stevens, 15 William St., New York.

17 ft. stepless Hydroplane, 25 to 27 mile speed; 25 H.P. three cylinder Pierce Budd engine, Bosch magneto; hull best oak and cypress construction, mahogany decks and finish; self aligning bronze strut and bearings; brass screw fastened throughout; used only half dozen times; price $700 cash. Can be seen at Evanston Yacht Club, Chicago. Address Stewart, 16 Balmoral Place, Winnipeg, Canada.

FOR SALE—$125. 14 H. P. Wat 2 cycle 3 cylinder engine in perfect condition, with Geis clutch, shafting, boxing propeller, Perfex ignition, Marvel carburetor, complete. Has been used about six months and has made 7 miles in a 30 x 8 ft. cruiser. Sold only because more power wanted. C. S. Sargent, 2117 Talbott St., Indianapolis, Ind.

FOR SALE—38 ft. Racine cruiser, better condition than new; new 30 H. P. Holmes motor installed last September; speed about 9½ miles; owner selling only on account of having purchased larger boat; can be seen at Pearce's Dock, Wakefield, R. I. For price and full particulars apply to Edw. L. Welsh, 304 Walnut Street, Philadelphia, Pa.

FOR SALE—Two wholesome cabin cruisers; one 35 x 8 x 2½. 14 H. P. motor, electric lights; other 40 x 9 x 3. 17 H. P. motor; excellent condition; complete inventories. I. M. Thompson, Velati Building, Washington, D. C.

FOR SALE.—One 12 H. P. Harthan reverse gear, in perfect order, with flange coupling, ready to connect to any engine. Price $12.00. Address J. S. Gaffga & Co., Greenport, Suffolk Co., N. Y.

A BARGAIN FOR SOME ONE.

A 32 x 9 glass cabin cruiser; 10 H. P. 4 cycle Palmer engine with reverse gear, pilot house controls; equipped with galley, stove and toilet; will sleep four comfortably; has full inventory, including searchlight, cushions, lights, life preservers, etc. This boat should be seen to be appreciated; boat can be seen at Haff's Boat Yard, Babylon, L. I.; photos and further information will be cheerfully furnished by owner; price $950.

BENJ. A. POWELL,
No. 634 McDonough St., Brooklyn, N. Y.
Phone No. 3749 Bushwick.

ACT QUICK OR YOU WILL LOSE THEM.

100 H. P. 6 cyl., 8 x 10 Standard engine, 1910 model, magneto and reverse gear attached and full equipment $1,300
75-90 H. P. 6 cyl. Standard, 1911 model, full outfit, good as new 1,000

BRUNS, KIMBALL & CO., INC.,
132 Liberty Street, New York.

WANTED—Cruising yacht or auxiliary over 35 feet. Send description and photograph; will give big value in my high-grade automobile. Health demands that I get salt air reason of exchange. W. E. Baume, 722 Clifton Ave., Newark, N. J.

SITUATION WANTED.

Marine gas engineer with 14 years' experience and unlimited Engineer's License wishes a position as engineer on a yacht or commercial motor boat; can furnish best of reference if necessary; willing to go anywhere. Address A. K., care of Motor Boating.

FOR SALE—20 ft. 6 H. P. launch, $100. 20 ft. 3 H. P. dory, $75. 2 H. P. four cycle engine, $40. R. H. Bartholomew, Minneapolis Journal, Minneapolis, Minn.

FOR SALE—8-10 H. P., 2 cyl., 2 cycle; gear in base; underwater exhaust; everything complete; fine condition; $250 outfit for $95. F. C. Eldred, Petoskey, Mich., 125 W. Lake St.

A SECOND hand Jager motor in good running order, complete with reverse gear; 3 cylinder, 4 cycle, 13 horse power. Will sell at a bargain. W. H. Moreton, 218 State St., Boston, Mass.

HUNTING cabin cruiser, 38 ft. long; 9 miles an hour; for sale at real sacrifice as owner is unable to use it. Complete equipment, tender, electric lights, searchlight. Gilbert M. Tucker, Jr., Box 74, Albany, N. Y.

FOR SALE—30 ft. V-bottom runabout, counterpart of Harvard coaching launch; 18-25 Sterling engine, speed 22 miles. Price $900. Apply Oscar Anderson, Norwalk, Conn.

WANTED—An auxiliary cruiser under 65 ft. over all. Also a cruiser or auxiliary cruiser about 40 ft. over all. These must be in perfect condition and BARGAINS. M. Fargusson, Naval Architect and Yacht Broker, Southport, North Carolina.

FOR SALE.

8 H. P. reverse gears, new and second-hand, standard make. 2 in. Schebler carburetors; also lubricators and propellers. Black Rock Machine Co., Bridgeport, Conn.

WANTED—Gasoline engine, 2 cylinder, 6 or 7 H. P.; also 4 H. P. Ferro; state particulars. Arthur Peters, Battle Creek, Mich.

RARE BUSINESS OPPORTUNITY.

The oldest, best established and best located marine and stationary gasoline engine sales and repair business in the South is for sale because the owners wish to retire. No use to talk or write without having $20,000.00 cash capital. Address Box 11, care of Motor Boating, 381 Fourth Avenue, New York City.

FOR SALE—Burgess Cutter, 30 x 22 x 7½ x 4½; sound, able, fast cruiser, modern rig, two suits of sails; about 800 lbs. lead inside, 3,000 lbs. iron outside; located on Lake Champlain; price $200; great bargain. Owner has no further use for her. For particulars address P. O. Box 276, Plattsburgh, N. Y.

FOR SALE.

21 ft. x 5½ ft. x 18 in. draft runabout launch with 8 H. P. Ferro double cylinder engine, complete outfit, two years old; engine forward in closed compartment; cost $650, will sell for $375; a rare bargain. O. K., Box 201, Westhampton Beach, Long Island, N. Y.

FOR SALE!

2 H. P. marine engine, in good condition. Price $18.00. Frank J. Mayer, No. 6 Shenango St., Greenville, Pa.

FINE 22 ft. open launch, complete with 7 H. P. Ferro engine and McClellan automobile top; one year old; splendid condition; price low. Box 26, Verplancks, N. Y.

FOR SALE.—One 20 H. P. 2 cylinder 2 cycle Eagle engine, complete with the following equipment, and in good running order, reversing gear, 4½ feet 1¼ in. brass shaft, one brass stuffing box, one 20 in. 3-blade brass propeller, 2 1¼ in. Kingston carburetors, oil and grease cups. Price $75.00. Address Frank Kelen, Riverhead, Suffolk Co., N. Y.

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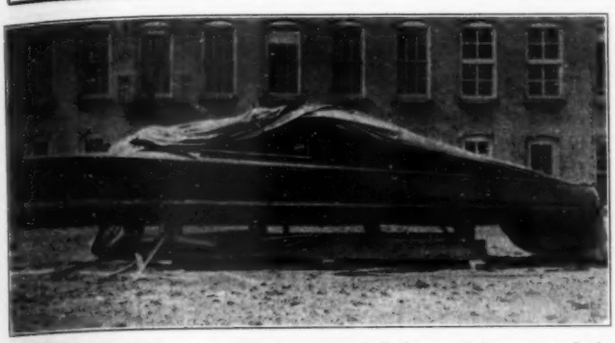
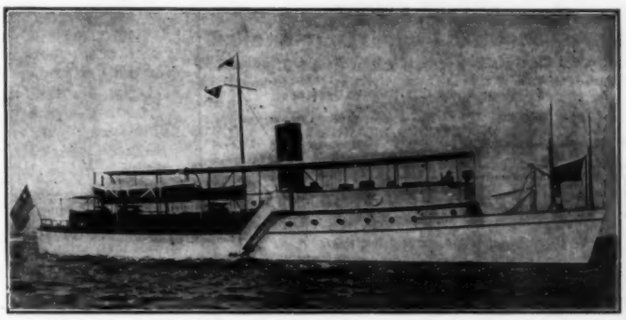
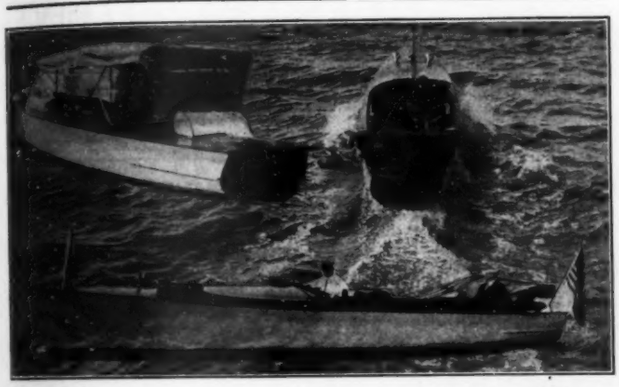


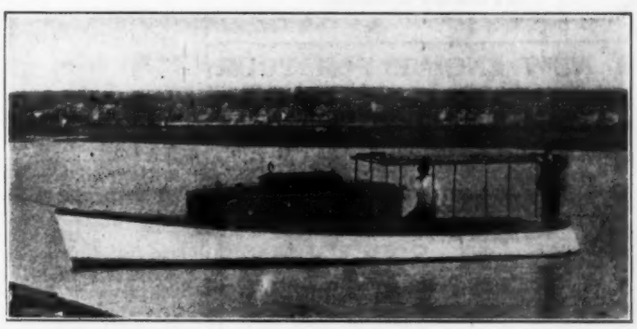
GENTLEMAN'S runabout, 16 miles; mahogany hull, bronze fittings, auto wheel; 20 H. P. Brownell motor, Bosch magneto, $500. Address P. Bilhuber, care of Steinway & Sons, Long Island City, N. Y.



NO. 1406.—For Sale.—92 foot sea-going cruising yacht; 20th Century motor; best furnished and fitted yacht of her size on the coast. Gielow and Orr, 52 Broadway, New York.



FOR SALE—Exceptional opportunity. This safe and seaworthy auto runabout and day cruiser equipped with every comfort and elaborately furnished. Designed by Skene, of Boston, and powered with a magnificent 50 H. P. 4 cylinder motor, self-starter and every modern device for safety and comfort. Speed from 0 to 19 miles, as desired. Condition perfect. Dimensions, 34 ft. x 6 ft. Seats 15 people. Price right for quick sale. This is not a cheap boat. If you are looking for Elco or Seabury quality at a saving of $1,000, write. Brokers wishing to list this boat, write. F. E. Hill, Imperial Furniture Co., Grand Rapids, Mich.



For Sale.—Torpedo stern hunting cabin semi-cruising launch. Hull 35 x 6½ ft. Cabin 13 x 6 ft. Toilet and mahogany lavatory. Large mahogany skylight. Electric lights. Lockers. 27 h.p. Lackawanna engine, four cylinder, Hydrex silencer, Paragon reverse gear. Apple dynamo, storage battery, voltmeter, brass running lights, life preservers, flagpoles, icebox, etc., etc.
A good sea boat, speed about 10 to 12 miles, only four years old, and in perfect condition. $800. A bargain. Apply to S. D. Shipley, 147 Grove Street, Stamford, Conn.

WELDING.

Cracked Cylinders and all Broken Castings in any Metal SECURELY Welded and GUARANTEED at about one-half the cost of a new part. NATIONAL Welding & Mfg. Co., Incorporated, 527 Jackson Boulvd., Chicago, Ill.

Eighteen Horsepower Standard, 3 cylinder $375
Fourteen Horsepower International, 2 cylinder..... 125
Seven Horsepower Baldwin 45
Seven Horsepower Stamford 40
Seven Horsepower Truscott 35
Three Horsepower Lathrop 40
E. E. PALMER, 31 East 21st St., New York.

FOR SALE—20 ft. Tuttle, open boat, equipped with two cylinder, 9 H. P. 1912 model Lackawanna engine and Joe's reverse gear; cushions, life preservers, folding anchor. First class condition. Now at Whitehall, N. Y. Price $275. F. R. Schoonmaker, Stratford Road, Schenectady, N. Y.

FOR SALE—One 20 H. P. 4 cylinder Continental, $155. One 35 H. P. 4 cylinder Northway, $180. One 45 H. P. 4 cylinder American-British, $265. Write for photo and description. Ferguson, 4191 W. Bell Pl., St. Louis, Mo.

MOTOR and sail boats for sale and to let, suitable for Great South Bay; special bargain, 26 ft. power boat, cruiser or day boat. Frank M. Weeks, 272 River Ave., Patchogue, L. I.

FOR SALE—Safety rear starter. Brand new. Will fit any engine. Worth $14, will sell for half. Ferguson, 4191 W. Bell Pl., St. Louis, Mo.

BUYERS—SELLERS. Small craft fetched or delivered ANYWHERE. Sailed, run or TOWED. Capt. Pearsall, Great Kills, Staten Island, N. Y.

CANADIANS. Second-hand engine bargains. Send for list. Guarantee Motor Company, 23 Bay Street, North, Hamilton, Ont., Canada.

USE "SNAPPER" ENGINES for your small boats. They are a big little engine built by The Automatic Machine Co., Bridgeport, Conn.

FOR SALE.

Boat and engine works, with full line of machinery and equipment in excellent condition; for manufacture of boats and gasoline engines; buildings in first-class order; size nearly one hundred feet square, two stories, possessing excellent water-front on St. Lawrence River in vicinity of Thousand Islands.
Also complete patterns for high grade two-cycle gasoline motors in sizes ranging from 2 to 120 horse power from one to six cylinders.
A large business has been conducted at this establishment and the reasons for selling are of a private nature.
This property will be offered at a great sacrifice.
Address all communications to Box 25, care of Motor Boating.

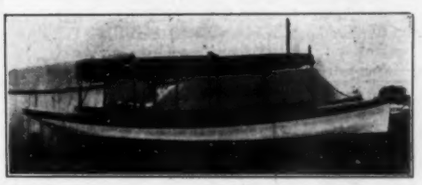
I HAVE secured the unsold 1912 product of prominent marine engine company. Can therefore sell the few remaining at prices that are right. Full factory guarantee. Four cylinder, 4 cycle, 60 H. P. medium duty. Single cylinder, 4 cycle, 6 H. P. medium duty. Also 1911 4 cylinder, 40 H. P. Trebert, 5 x 5 in. One 1912, 4 cylinder, 2 cycle, 24 H. P. Waterman. An exceptionally high grade 100 H. P., 4 cylinder, 4 cycle racing engine built by the best shop in the country; duplicates in famous racing boats. "Exceptional," care MoToR BoatinG.

NEW 54 H. P., six-cylinder Elbridge engine, just from factory. Aluminum manifolds, base and cylinder heads, extra finish throughout. Built for Mr. Coleman du Pont of Wilmington, Del.; exchanged for a larger power. Price $700. Emerson Engine Co., Alexandria, Va.

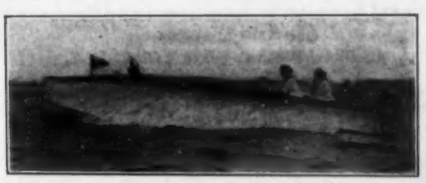
FIRST check for $350 takes 22 ft. Lozier built motor boat, 7½ H. P. Buffalo engine. Cost $850. Substantial and comfortable. Speed 9 miles. Is in commission and can be demonstrated. Am buying faster boat. F. O. Grattan, Red Bank, N. J.

One Model B, 25 H. P. Sterling engine, 4 cycle, 4 cylinder, bore 4¼, stroke 5½, with Bosch magneto, aluminum base, bulkhead spark and gas control, reverse gear and clutch; in first class condition, having been run only two seasons. Only object in selling is to get larger engine. Address "Braiduct," care of Motor Boating.

FOR SALE—A 24 ft. Mullins' runabout, two cylinder, two cycle, 14 H. P.; long inventory list; used two seasons; fine condition; owner buying cruiser. Stevens, 57 East Woodbridge, Detroit, Mich.



FOR SALE—Family launch, 25 ft. x 6 ft. 6 in.; standing roof; 10 H. P., 2 cylinder Palmer engine, fresh from factory; built in Cos Cob; full modern equipment; 9 to 10 miles; cost over $1,000; sell about half. Chas. G. Bliss, Essex, Ct.



TWENTY foot hydroplane, almost new; thirty horsepower; mahogany decks, cushions; will sell about half cost. R. M. Hunter, P. O. Box 1047, Philadelphia, Pa.

ELCO EXPRESS LAUNCH.

35 ft. six-cylinder, 60 H. P., 22 to 24 miles; used only a few months in fresh water; machinery perfect; woodwork like new; price only $2,500 as I wish to make quick change to cabin launch. Stored and shown by Chas. L. Seabury & Co., Morris Hts., N. Y. City. Write owner for pictures. E. A. Strout, 420 Riverside Drive, New York.

FOR SALE.

FOR SALE: New motor boat, 34 x 6½ ft.; 4 cylinder 4 cycle engine, speed 12 to 14 miles; large roomy cockpit and Summer cabin. Asa B. Smith, 56 Amity St., Patchogue, L. I.

The Meet at Monaco.

(*Continued from page 5*)

copper water jackets, they have common overhead valve gear enclosed by a single aluminum housing. Each set of four has its own carbureter and intake manifold on the right-hand side, but the eight exhaust pipes come out direct from the ports on the opposite side. The motor developing 600 horsepower and the boat having a speed of nearly 50 knots an hour, Skisc should be a really serious competitor for the Frenchmen.

Despujols has four boats in the racer class: Flambeau, Sigma IV, Socram I and Seminole. The latter cannot be considered as a racer, but the three others are really speedy craft. Flambeau is one of the most pleasing boats in the exhibition. Her lines have a very great similarity with those of the Duke of Westminster's Ursula, a boat which has not put in an appearance this year, and, according to her builder, she will be decidedly faster than the English racer. Flambeau carries a six-cylinder Despujols motor, exactly similar to that aboard Santos-Despujols, and, like it, is set three or four inches out of the longitudinal center line.

Socram I and Sigma IV are fiddle type displacement boats, having everything of the hydroplane except the step. Sigma IV, of course, is a development of last year's Sigma III, which was also raced by Ricardo de Soriano. Her power plant consists of a four-cylinder Despujols of the same bore and stroke as the big six aboard the hydroplanes, and having exactly the same method of installation out of the center line. Socram I only differs by reason of the size of the motor, the dimensions being 4 by 8.8 inches. Tellier has two boats in this class: J'en Veux and Na-Roche, both with engines by Janvier-Picker.

The German element is represented by Lurssen's Annette III, engined by Sauer. The boat is the natural successor of last year's Lurssen, and will doubtless have that boat's peculiarity of running with three-quarters of her length out of water. She has the same fine bow, the hard break into the flat bottom, flat sides, and gradual narrowing towards the transom stern. There is another Saurer boat built by Deschamps, a French constructor.

The 21-footer class is a new feature this year. There were a few boats of this type last year, but there was no special class and no special prizes for them. They have been specially encouraged and have come forth 18 strong, 14 of them being from England, 3 from France and one from Italy. Competition here will be decidedly keen, for all the motors are specially built to the cylinder limitations; the total weight varies but a few pounds, and the general design is the same throughout the entire series. It is a competition of motors as much as of hulls, the former having been built by such well-known firms as Sunbeam, Austin, Wolseley, Brooke and Vauxhall, and the latter having Sunders, Hart Harden, Brooke and Despujols as their producers. The uniformity which was mentioned as characteristic of the boat at Monaco is probably more pronounced among the 21-footers than among the larger craft. On the other hand, the motors are of a most diversified nature. Sunbeam, who has engined five of the boats—Cockle Shell, Vicuna III, Vixen, Fuji-Yama and Princess Caprice—has a racing car type of motor, measuring 3.1 by 4.7 inches bore and stroke, with valves on one side and the stems inclined so as to improve the form of the combustion chamber. Austin has a special type of similar dimensions, having cylinders and upper half of crank-chamber in a single casting and valves in the head. This motor drives forward to a reducing gear, the propeller shaft then running aft. In Apache, one of the French boats

(*Continued on page 64*)

The Meet at Monaco.

(*Continued from page 62*)

engined by Picker-Janvier, a reducing gear is also employed, but in this case it is placed immediately to the rear of the motor, as on a motor car. Picker, the designer of this motor, has tried the experiment of fitting four independent carbureters with fairly satisfactory results so far as can be ascertained from the trials. It is found that the carbureters have to be smaller than is usually considered necessary for a single-cylinder of the given dimensions. Picker has five motors here, and on four of them he is making use of a separate carbureter per cylinder. It should be pointed out that in every case these motors run at high speeds, the Picker-Janvier in Apache having turned over at 3,000 revolutions, although 2,500 revolutions is its normal speed.

The Gulf Coast.

(*Continued from page 8*)

and crossed the lake in just four hours in spite of a brisk head wind that gave us plenty of spray. We passed into the canal just ahead of the semi-weekly mail motor boat and settled down for a sixty-one mile canal run to Fort Lauderdale and civilization. In due course of time we arrived there without a stop or slow down, and unfortunately with no sight of alligators to photograph. A more monotonous run can hardly be imagined than this canal run upon the interminable straightaways through the glades, beneath the scorcing sun, with nothing to indicate where you are except the mile-posts. There may be novelty in it at first on account of the utter desolation of it all, but all that wears away long before you have logged ten of the sixty odd miles.

That night the faithful chief got busy with developer and hypo while the skipper, as usual, sought refuge in a moving picture show. The chief somehow seemed to get better results if the skipper was ashore and couldn't sit on any undry negatives. Next morning we completed our return run to Miami, again taking the inside route on account of that persistent east wind.

Our gasoline consumption on the return trip across the state was surprisingly small, and we could account for the fact only because we had shipped some of our equipment from Tampa to New York by freight, and now had room on board for Knee Deep, and carried her on this run instead of leading her by the halter as we had done for two thousand miles and over. This discovery sort of brought Knee Deep into disfavor, even in the eyes of the skipper.

We lay for a few days at Bert Southall's yard, the most popular yard in Florida, and cleaned house thoroughly before turning Querida II over to new hands which we gratefully knew were friendly ones. A gold cuff link, mourned as lost weeks ago was joyfully brought to light. The bilge surrendered many a treasure under protest and grease. Garment after garment was fished out from hidden recesses, recognized with difficulty as a pair of trousers belonging to the skipper or an erstwhile raincoat which had once graced the chief's back on Fifth Avenue, and reluctantly and gingerly dropped over the side. But between the cypress ceiling of the cabin and the outside planking is a narrow space where still repose countless treasures absolutely inaccessible and upon which the eye of man is destined never again to rest. We know not exactly what they comprise—but we know that they include six pipes, forty-four five-cent cigars, two fountain pens, a necktie, four knives, one thousand boxes of safety matches, two cakes of soap bought early in the cruise and never replaced, sixteen pencils, an electric flashlight, and several dill pickles.

The Fay and Bowen is as good as new. Its performance speaks for itself. Its makers are entitled to high praise for turning out a two-cycle engine which two amateurs were unable to put on the blink. She pushed us up the waters of Tampa Bay just as steadily and consistently as she had moved us down the North River from the New York Motor Boat Club float five months and 2,350 miles before.

The users of NAVALITE are the true builders of its reputation.

Theirs is the verdict that counts

New York City, December, 1912.

We have used Chicago Varnish Company's marine line for the yachting season of 1912 and found it A1. For spar varnish, *Navalite* has no equal. It lasts the longest, has a beautiful lustre, does not turn white and flows on easily. It does not skin over in the can nor gum the brush. Some of these qualities we have found lacking in all other marine varnishes.

Yacht	(Signed)
Corsair	W. B. Porter, Capt. (Owner, J. P. Morgan)
Scout	E. Matson, " (Owner, Aug. Belmont)
Aurora	Christ Christiensen, " (Owner, Cornelius Vanderbilt)
Sultana	Norman Ferguson, " (Owner, Mrs. Harriman)
Noma	E. Roberts, " (Owner, W. Astor)
Elena	W. Dennis, " (Owner, Commodore Plant)
Winchester	A. Johnson, " (Owner, Commodore Rouss)
Enchantress	Oliver Smith " (Owner, Commodore Iselin)
Iolando	A. C. Berton, "
Alvina	C. Iverson, "
O-Wee-Ra	R. W. Lewis, "
Columbia	John Bond, "
Westward	C. Coalfleet, "
Emeline	E. Howell, "
Corona	H. Vogelberg, "
Constellation	B. Watson, "
Isis	R. F. Sherlock, "

Yacht	(Signed)
Hiawatha	Frank F. Johnson, Capt.
Idler	Ch. Percival, "
Rambler	Chas. Small, "
Zara	F. L. Littlefield, "
Sagamore	B. Jarvis, "
Intrepid	B. Purdy, "
Atlantic	E. Pagel, "
Wild Duck	Chas. Hanscomb, "
Linta	John Moore, "
Margarett	D. Dungan, "
Mohigan	Chas. Staalesen, "
Chanticleer	E. Colbeth, "
Alcyone	D. A. Kerr, "
Flying Fox	F. Champlain, " (Motorboats—largest in America)
Josephine	J. E. Holtz, "
Allegro	E. Elldridge, "
Whirlwind	F. Smith, "
Paula	B. Wallace, "
Edith	Chas. Petterson, "
Cynthia III	B. Larson, "
Alacrity	J. Baldwin, "
Oneida	B. Olson, "
Itasca	C. Swanson, "

Manufacturers make *claims*. Consumers make *tests*.

SUPREME YACHT WHITE

The years have proved Supreme Yacht White unequalled for use on hulls and other exterior works of yachts. It may also be used for interiors. It is pure white in color, covers well, works freely, without leaving brush marks, and dries with a handsome lustre, giving a very durable finish. It neither chalks nor cracks.

EGGSHEL-WHITE

For artistic effect, no rubbed enamel finish for interiors gives the beautiful results obtained by using Eggshel-White. It requires no rubbing and dries rapidly to a *perfect eggshell gloss*. Two qualities of Eggshel-White, that make it the best known enamel on the market for interior finish, are these: It dries *absolutely without brush marks*, and *we guarantee* it *never to lose its pure white tone* if C. V. Co.'s Flat Lead is used for under coatings.

PRICES

Navalite	$4.50 per Gal.
Supreme Yacht White	$3.50 per Gal.
Eggshel White	$4.00 per Gal.

Send for list of Marine Specialties

Don't bank on *promises*, put your faith in *proof of work done*.

The masters and captains of America's biggest and best sailing yachts and power boats unite in pronouncing *Chicago Varnish Co.'s Navalite* the most perfect marine finish on the market today.

NAVALITE EVERWHITE LASTS LONGEST

A GUARANTEE

We guarantee Navalite not to turn white in fresh or salt water and to outwear any other marine varnish.

Fifty years' experience in manufacturing varnish has enabled us to perfect Navalite—to give it those qualities most needed by the marine trade. Good body—to cover well. Quick in drying—so that it may be applied with safety where the atmospheric conditions are bad. Free in flowing—to apply easily. Elastic—to withstand changing temperatures of air and water. It does not skin over if left in can uncorked nor gum up on the brush. We thoroughly test every tank of Navalite to guarantee its uniformity.

Boiling water does not affect Navalite. Send for a sample can of Navalite and a strip of japanned tin. Pour the varnish on the tin and, when dry, submerge in boiling water. It will not turn white nor will it be otherwise affected by the boiling water.

Navalite as perfected today is the only spar varnish bearing the stamp of unqualified approval of the men best known in the yachting world. Theirs is the verdict that counts.

OTHERS MAKE STATEMENTS, WE SHOW PROOF

CHICAGO
2100 Elston Ave.

CHICAGO VARNISH CO.

NEW YORK
50 Church Street

Among the Clubs.

(Continued from page 33)

Baltimore Regatta.

Under the auspices of the Maryland Motor Boat Club, a motor boat regatta will be held on July 4th and 5th at Baltimore. There will be all classes of boats including cruisers, cabin boats, open boats, displacement speed boats and hydroplane speed boats with cash prizes for each. Races are open to any boat owner subject to the rules and regulations of the racing board and handicaps will be in accordance with the A. P. B. A. rating. The annual 200-mile open race to Holland Bar Lighthouse and return will take place on July 25th.

Official Opening on May 30th.

The Byram River Yacht Club of Portchester, N. Y., announces the opening of the season on May 30th, when the annual fishing race will take place. On June 21st, there will be a sailboat race to Stratford Shoals and return open to auxiliary boats and on July 26th, water sports and a free-for-all race open to all boats belonging to recognized yacht clubs.

Election at Cedar Rapids.

The Cedar Rapids Motor Boat Club held its annual meeting recently and elected the following officers: Commodore, A. H. Roth; Vice-Commodore, Dr. Wm. Finn; Rear-Commodore, Dr. J. H. Calder; Treasurer, Mark J. Myers; Secretary, I. M. Preston.

Cambridge Races.

The third annual regatta of the Cambridge Yacht Club, of Cambridge, Md., has been announced for June 9th. A new Classification System and Course Method will be inaugurated which is expected to develop short, snappy and more interesting events. The course will be elliptical in shape, two straight stretches with a short curve at each end, well buoyed, with the start and finishing point at the center of the front stretch. There will be all classes of boats and trophies for all events. All Cambridge races are open to all owners of motor boats.

New Officers for Tamaqua Boat Club.

At the annual meeting of the Tamaqua Boat Club, Sheepshead Bay, N. Y., the following officers were elected for the ensuing year: Commodore, Arthur Ball; Vice-Commodore, J. Preiss; Rec. Secretary, S. B. Neill; Fin. Secretary, Wm. White, Jr.; Treasurer, G. E. Louis.

Flat Rock Races.

The Flat Rock Motor Boat Club, is making extensive improvements to its club house and grounds on the upper Schuylkill River in preparation for an active racing season. One of the features of the racing schedule will be an interclub semi-speed boat race for the Championship of the Schuylkill River to be contested for by the Norristown Motor Boat Club, Philadelphia Canoe Club, and Flat Rock Motor Boat Club. The finals of this event will be run in connection with the Flat Rock's annual speed boat race on August 16th. There will be many other racing events on the Delaware River during the season of 1913.

Philadelphia-Bermuda Entries.

The change this year in the date of the Philadelphia to Bermuda Race to June 7th, seems to have attracted many boat owners for already several entries have been received and there are other prospective entries in view. The boats entered are the Dream, Commodore Chas. L. Lagen, Yachtsmen's Club, Philadelphia, Barbara II, Vice-Commodore W. M. Duncan, New York, to be in command of Commodore J. G. N. Whitaker and the Tec, W. T. Wheeler, Jamaica Bay Yacht Club, of New York and negotiations are pending for the entry of three additional New York boats, two of which are the Ailsa Craig, winner of the first Bermuda race, and the Sea Wolf II, owned by Le Roy Moody. Other prospective entries are the Kathemma, the contender with the Dream in last year's race, owned by Commodore Wm. C. Smith, of Ocean Gate Yacht Club, Tocsam II, W. D. Mulford of Ocean City Yacht Club and the Serenity, the speedy cruiser of Arthur Block, of the Philadelphia Yacht Club.

Bayside Entertainment.

The Bayside Yacht Club has just given an entertainment called "Tinkle Tinkle" or a "Nautical Night Off," which was a great success both financially and otherwise. The club has named its new racing class the Bayside Butterflies and their first race is scheduled for May 24th.

Club Changes Name.

The Atlantic City Yacht Club is the name by which the Seaside Yacht Club will be known in the future. This move was approved by all the members, who thought in order to make the club a strictly home affair, it should bear the city's name. The new club includes membership for the ladies and for the young folks. The handsome new club house at the foot of New Hampshire Avenue will be opened on Decoration Day. Allen K. White was unanimously elected Commodore of the club.

Keokuk Regatta.

Officers of the local motor boat club announce that the date of the annual regatta of the Mississippi River Power Boat Association to be held in Keokuk will be August 5, 6 and 7th. The building of the club house for the local club is well under way and it will be one of the handsomest on the river. The sixty mile lake will allow every event to be run on a straightaway.

Newburgh Plans.

The Newburgh Yacht Club have completed plans for the coming season which include the usual club runs, shore dinners, clambakes, a series of dances and card parties, a couple of stags, at least one musical, exclusive of any regattas or races which may be arranged later on. Owing to the inability of members and guests to obtain gasoline for their motors at the club house it was decided to erect a gasoline tank on the club premises and retail it to them and flag-flying visitors, at cost price.

Clubs Join Forces.

The newly organized Minnetonka Motor Boat Club has joined arms with the Mississippi Power Boat Association and some events attracting wide attention will be scheduled. Arrangements are being made for a big opening regatta on June 1st, in which many of the fastest boats in that part of the country will compete. The temporary home of the club will be in the remodeled Tonka Bay Casino.

Here's Absolute Proof of the Reliability of Caille Perfection Engines

EVERY day in the year, rain or shine, snow or hail, this man can be seen with his little open launch delivering mail and messages to the freighters as they pass Detroit on their way through the Great Lakes.

Every boat must be met, regardless of weather conditions. It must be a service of absolute certainty. An unreliable, balky engine will not be accepted by the great transportation companies as an excuse for failure to meet a single boat. Nobody knows this better than Capt. J. W. Westcott, whose picture appears above. And so, after hearing much of the reliability of Caille Perfection Engines, he concluded to try one—to put it to the most severe test to which a marine engine could ever be subjected. How well the engine withstood this test is best told in Capt. Westcott's own words in the following letter:

Caille Perfection Motor Co.,
City. Detroit, Mich.

I enclose two photos, one showing my boat, in which I have one of your 3½-4 H. P. engines with igniter, the other showing the work it has to do. We meet and deliver messages to every freighter passing Detroit, no matter what kind of weather, so must have an engine that can be depended on to start every time and always be ready to go. Your engine meets these requirements exactly. It is by far the best engine I have ever used. I will be glad to show anyone the work my boat is doing and can easily convince them that you have a most wonderful engine. Expect to build another boat later and it will certainly have a Caille Perfection Engine in her.

CAPT. J. W. WESTCOTT,
Marine Reporter.

Single Cylinder, 6 H. P. Caille Perfection Engine with Water-proof Ignition.

Perhaps your boat may never be called upon to render such exacting service. Perhaps your engine may never be required to withstand such a test. But it's mighty comforting to know that it is equal to such a test—that it is absolutely reliable under the most severe conditions—that it will always take you where you want to go and bring you safely back—that it is always ready to lend a tow, but never needs one.

Caille Perfection Engines Are Water-Proof, Weather-Proof, Trouble-Proof

They are the most simple, most compact, most reliable engines ever designed for marine use. Run equally well in fresh or salt water. All parts are completely enclosed except the flywheel. No oil can splash out to soil clothing. Any member of your family can safely run these engines in any kind of weather. They need no protection whatever. Run on gasoline or kerosene.

No Cranking--No Adjusting--No Battery Expense or Trouble

The Perfection Igniter produces such an extremely hot spark of such high voltage that, no matter how poor the mixture may be when starting, a simple rock of the flywheel sets the engine going at once. The igniter needs no adjustment. It is completely enclosed in a waterproof case and all parts so arranged that it is impossble for it to get out of order. No batteries, no complicated wiring, no auxiliary apparatus is required—not even a switch. No matter how slow or how fast the engine runs, the spark is just the same. The igniter runs in either direction, enabling you to run your boat forward or backward, without reversing device. Not affected by heat or cold.

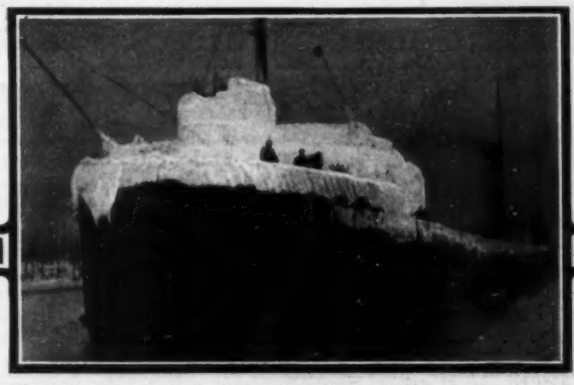
Caille Perfection Double Cylinder Unit Power Plant

These outfits embody our highly efficient double cylinder engine mounted on a single base with our positive, quick acting reversing gear, making a sturdy, compact unit. There is absolutely no chance for loss of power through binding—no chance for shafting to get out of alignment. The greatest possible amount of power is delivered at the propeller. Easiest engine to install easiest to operate.

Send Today for Beautiful Engine Book

This describes our complete line of engines for all purposes from 2 to 30 H.P. Beautifully illustrated. Send today. A postal brings it.

Caille Perfection Motor Co.
1202 Caille Street Detroit, Mich.



Capt. J. W. Westcott Meeting a Large Freighter.

M. M. Meyers Sales Co.
224 North 11th St. Philadelphia Pa.

W. C. Disbrow Jr.
71 Cortlandt St. New York N.Y.

S. V. B. Miller
72 Marion St. Seattle. Wash.

R. W. Thompson
114 Light St. Baltimore Md.

W. L. Masters & Co.
150 W. South Water St. Chicago Ill.

California Gas Engine & Motor Boat Co.
76 Clementine St. San Francisco Cal.

W. J. Forbes
243 Columbus Ave Boston Mass.

Marine Construction Co.
Toronto-Ont.

Wallace Bros.
Box 11 Norfolk Va.

SERVICE STATIONS *of the* GRAY MOTOR CO.

Repair parts for *all* Gray Models—valuable suggestions in selecting the right motor and equipment—expert advice as to the proper installation of the same

—in fact a complete factory service is rendered by our service stations located in the principal cities throughout the world.

Our sole aim in establishing these factory service stations is to give Gray owners the most prompt and liberal service possible.

And this world-wide service is mighty important to all Gray owners.

It eliminates the possibilities of annoying delays or loss of time—it gives the pleasure boat owner more confidence, hence more pleasure from his outfit—it assures the owner of commercial craft that he can operate on schedule time without danger of costly delays.

This is, without question, the most complete service of its kind in the world.

The photographs show only a few of our larger service stations; in addition we are represented in

Houston, Texas—New Orleans, La.—Los Angeles, Cal.—Portland, Ore.—Tacoma, Wash.—LaCrosse, Wis.—Madison, Wis.—Cincinnati, Ohio—Erie, Pa.—Buffalo, N. Y.—Montreal, Quebec—Vancouver, B. C.—and hundreds of other cities in United States and Canada.

Foreign Service Stations:

London, England—Berlin, Germany—Helsingfors, Finland—St. Petersburg, Russia—Stockholm, Sweden—Arendal and Bergen, Norway—Barcelona, Spain—Cape Town, South Africa—Buenos Ayres, Argentine, Rio de Janeiro, Venezuela and Peru, South America—Mexico City, Mex.—Sidney and Perth, Australia—Adelaide and Melbourne, South Australia—Auckland, N. Z.—Latrobe, Tasmania—Shanghai, China—Yokohama, Japan.

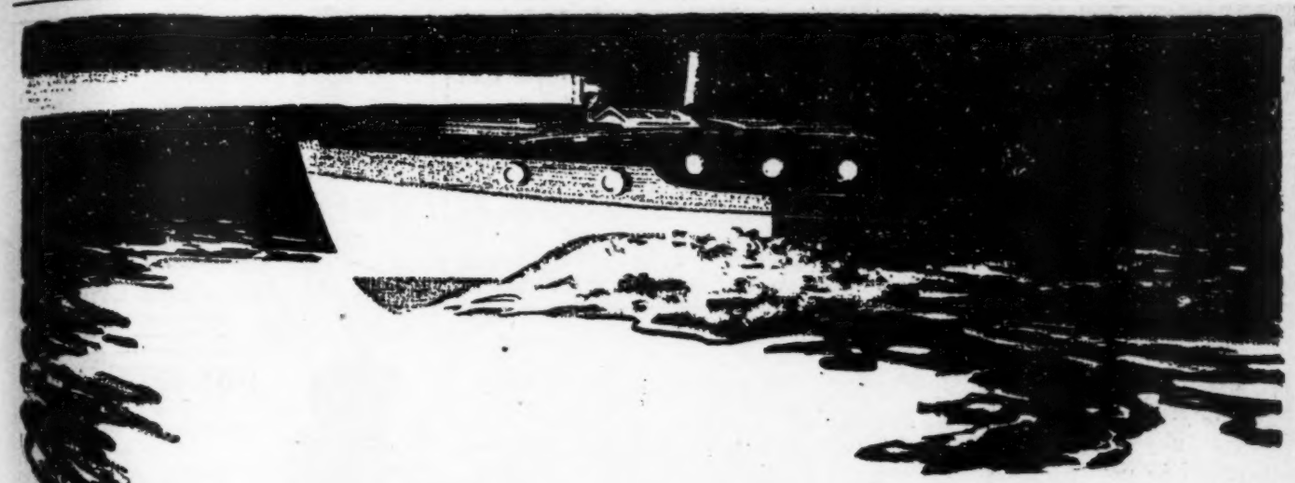
We would like to send you our big, valuable engine book and tell you more about Gray Motors and Gray Service—write for a copy today.

Gray Motors are made in sizes from 3 to 36 H. P., 1, 2 and 3 cylinders

$55 and upward

Including the above list there are over 1,000 dealers that sell Gray Motors and give Gray Service.

GRAY MOTOR COMPANY
574 Gray Motor Bldg., Detroit, Mich.



YOUR motor boat will give you ten times more pleasure this summer if you arrange at once to have it equipped with the complete

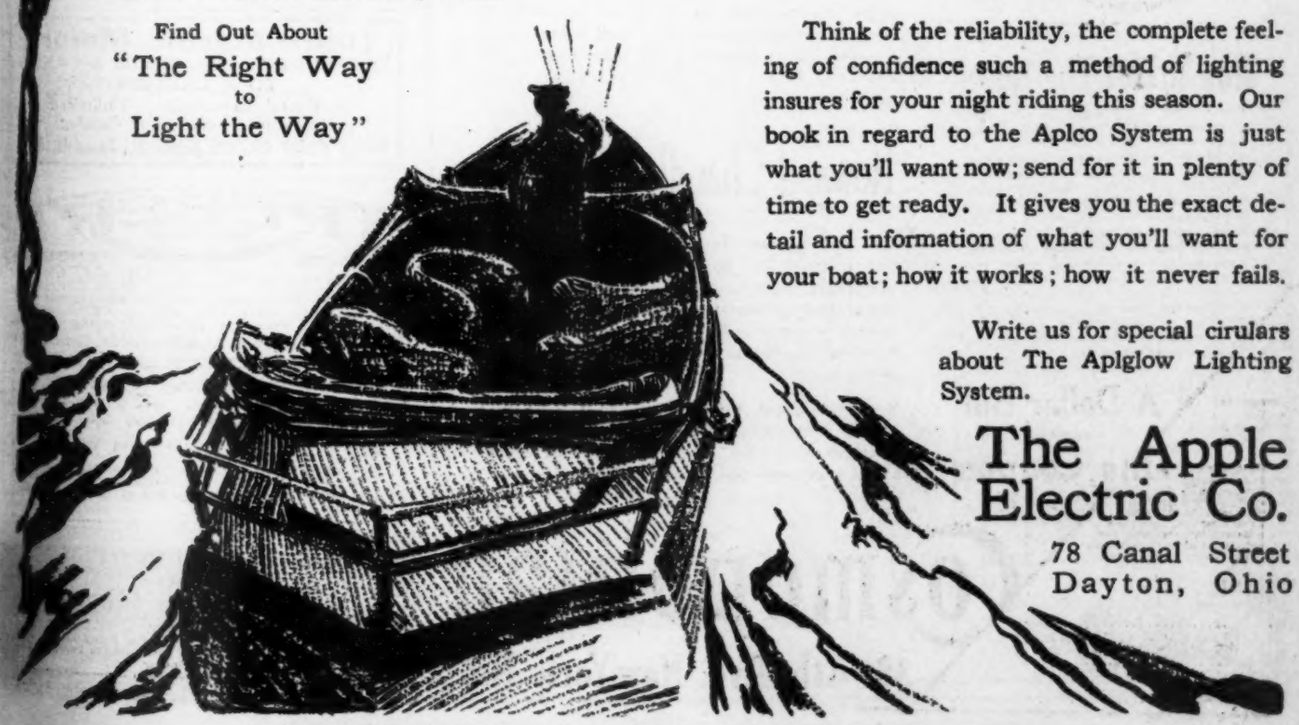
Aplco Electric Lighting System

You don't want to light your boat with gas and oil lamps; it's one of those added risks that need no longer be taken.

The Aplco system gives you the finest kind of a search-light that is scientifically built to project a fog-piercing ray; running lamps of heavy brass that comply with government regulations in every way, and they have no ventilators to let in water: bow and riding lights of the same high quality; dome lamps and brackets for your cabin, and extension hand lamp.

The system is built and designed by Vincent G. Apple, who first devised electric lighting for motor cars in 1907. It is built with the utmost exactness and care in the Apple plant; each system is composed of four parts—a dynamo, driven by the boat's engine, a storage battery, an automatic cut-out, a zero center ammeter or a volt meter and ammeter, the last three items being embodied in the switch-board of the B-2 and B-3 systems.

Find Out About
"The Right Way
to
Light the Way"



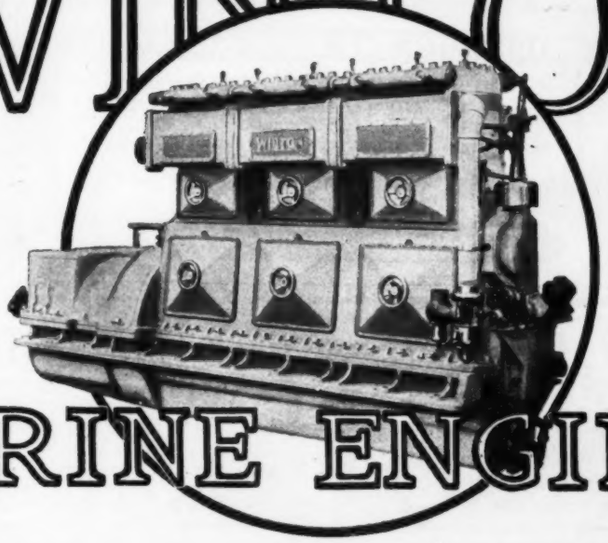
Think of the reliability, the complete feeling of confidence such a method of lighting insures for your night riding this season. Our book in regard to the Aplco System is just what you'll want now; send for it in plenty of time to get ready. It gives you the exact detail and information of what you'll want for your boat; how it works; how it never fails.

Write us for special cirulars about The Aplglow Lighting System.

The Apple Electric Co.
78 Canal Street
Dayton, Ohio

EVERY reader of MoToR Boating is a live prospect for the advertiser of anything appealing to the marine trade or boat owners. There is therefore no waste or unproductive circulation. MoToR Boating advertises itself in newspapers, magazines and mediums of general circulation, thus sifting out those boat owners who are susceptible to advertisements and eliminating the disinterested readers. This accounts for the responsiveness of MoToR Boating's circulation.

WINTON



MARINE ENGINES

OUR double-page announcement in the April motor boating magazines has made an impression worthy of the fact itself: that the advent of Alexander Winton into the marine motor field marks an epoch in that industry.

From the letters that have come to us from the leading naval architects; from the congratulations of the boat-building fraternity and the motor-boating experts, it has been made very plain to us—as it must be to you—that there can be only one best motor in the "big" class, and that is the Winton Six. We are ready to prove this by any kind of a demonstration.

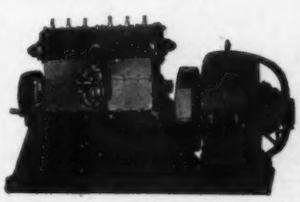
The serious consideration of any other type of motor for large power yachts cannot exist. The naval architect who has been commissioned to design a boat of this character, as well as its prospective owner, is now in a position to figure on a power plant worthy of the largest, finest, motor craft that will ever be built along lines of modern luxury and efficiency.

Complete information in regard to the unequaled Winton Six is at the disposal of naval architects and their clients. We would especially urge anyone who requires a power plant of this size and perfection to write to us at once; our sales manager is ready to lay all necessary details before you at your office. Better still, in carrying out plans of such magnitude, both client and architect will find it well worth while to arrange for a visit to this plant. It cannot help being a source of the greatest interest and inspiration.

Prices

Horse Power	60-75	100-125	150-200
Price	$3200	$5000	$6000
No. Cylinders	Six	Six	Six
Bore	6½ in.	8 in.	9 in.
Stroke	9 in.	11 in.	14 in.
Rev. per min.	400-500	350-450	350-425
Weight	5000 lbs.	8000 lbs.	15000 lbs.

We have for immediate delivery 150-200 H. P. Engines.



The Winton Small Generator

We consider this the finest-balanced, the cleanest and smoothest in appearance, the quietest and best proportioned generator set ever offered.

It consists of a 5 K. W. Crocker-Wheeler generator direct connected to a six cylinder T-head 3 x 4 motor with the valves entirely enclosed. So thoroughly quiet is its operation that even when working on its full load, the breaker box on the magneto makes more noise than any other working part on the engine. Its governor is so sensitive that it goes from full load to no load with the least possible variation in its speed load. Its oiling system is automatic and when the machine is once started no further attention is required.

We give as much attention to the building of this small engine as we do to our larger sets, and the workmanship of this motor is what makes it so thoroughly quiet and so smooth in its operation. It is furnished complete with magneto, governor, plugs and carburetor, ready to run.

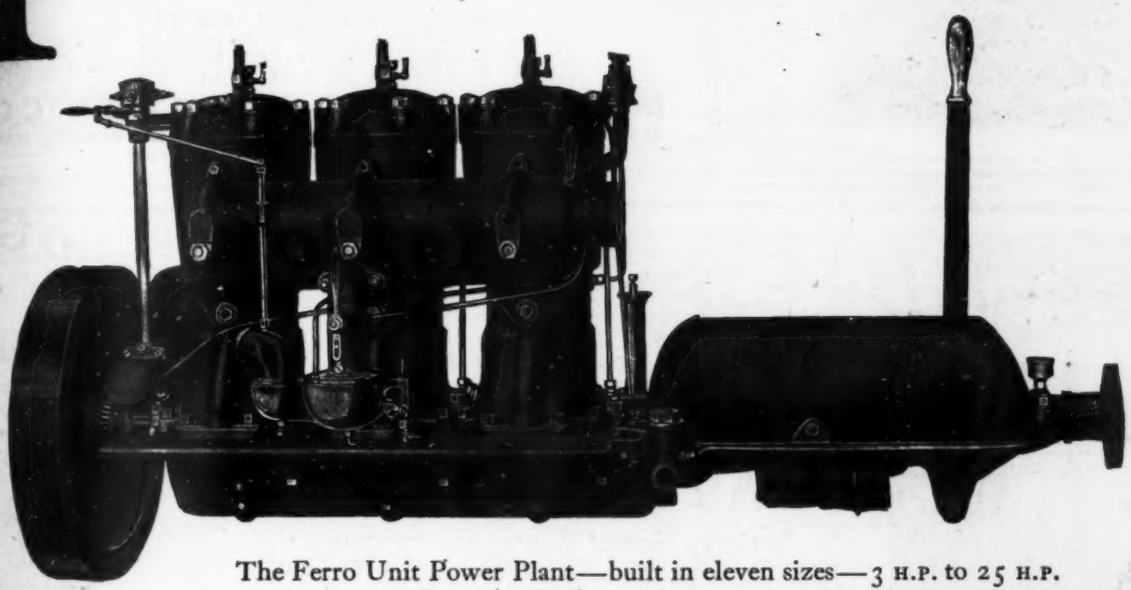
The Winton Gas Engine & Mfg. Co.

2116 West 106th Street, Cleveland, Ohio

CHARLES LANG, Vallejo, Cal.
THE SEATTLE CONSTRUCTION & DRY DOCK CO., Seattle, Wash.
TAYLOR & YOUNG, Limited, Vancouver, B. C.

The World's Standard

FERRO



The Ferro Unit Power Plant—built in eleven sizes—3 H.P. to 25 H.P.
Prices range from $60.00 to $500.00.

The Best-built Motor in America

Users say So—Sales Prove It!

GUARANTEED to develop more actual horsepower at its rated revolutions than any other engine of similar size, bore and stroke operated under identically similar conditions.

This guarantee is backed by a company of established reputation both as to the quality of its product and its financial responsibility, owning and operating the largest, most complete and best equipped engine plant in the world.

1500 Sales representatives scattered in every country and in almost every port in the world emphasize what FERRO SERVICE means to the 40,000 owners and operators of Ferro Engines.

Send for illustrated catalog.
Let us give you the name and address of our nearest dealer.

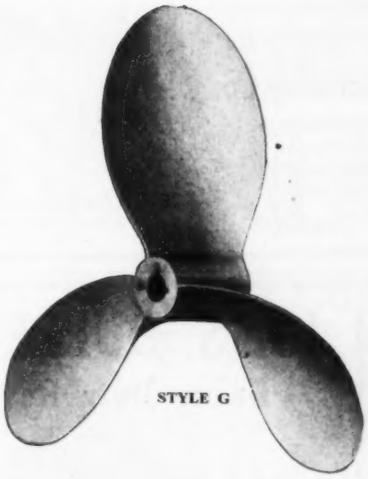
THE FERRO MACHINE & FOUNDRY CO.

Main Office and Plant, 36 Hubbard Avenue and East 66th Street, Cleveland, Ohio, U. S. A.
Ferro Dealers in all principal cities and towns.
New York Distributor, THE GASOLENE ENGINE EQUIPMENT CO., 133 Liberty Street, New York City.

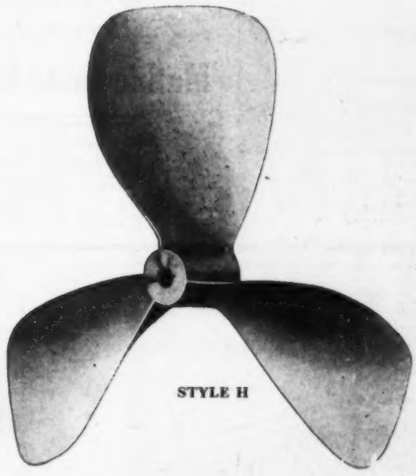
COLUMBIAN PROPELLERS

MOST POWERFUL IN THE WORLD

FOR CRUISERS, SMALL YACHTS, PARTY BOATS, FISHING BOATS, and for other medium duty boats using propellers less than 30 inches diameter, we back the "COLUMBIAN" "Style G" Propeller against the world.



STYLE G



STYLE H

FOR LARGE OYSTER DREDGES, FISHING BOATS, FERRY BOATS, PASSENGER BOATS, YACHTS, and other heavy duty boats, we can furnish a "Style H" "COLUMBIAN" Propeller that will beat everything else made.

Universal Strut fitted with Die-cast, Anti-friction Bearings which can be replaced when worn. Aligns itself to any shaft angle.

These two "COLUMBIAN" Wheels—styles G and H—together with the "COLUMBIAN" Architects Propeller, which has beaten everything else on hydroplanes, are the three MOST POWERFUL PROPELLERS made anywhere in the World to-day.

DON'T BUY

Don't Build, Don't Re-model, Don't Overhaul until you read our catalog,

"PROPELLERS IN A NUT SHELL."

It also tells you about

COLUMBIAN RUDDERS

Outboard Rudders — Launch Rudders
Speed Boat Rudders — Universal Struts
Hydroplane Rudders — Universal Stern Struts
Combination Outboard Rudders and Universal Stern Struts

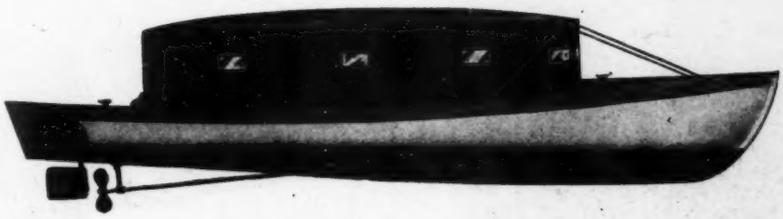
WRITE

COLUMBIAN BRASS FOUNDRY

218 North Main Street

Freeport, Long Island, New York

KENYON TOPS DEFY STORMY WEATHER



A Kenyon Auto Style Top on your boat is almost as necessary as a roof on your cottage or summer home.

With an ordinary open boat you miss half the joys of Motor Boating, because you are entirely dependent on the weather.

With a Kenyon Top you can defy the sun and storm. You can be independent of the weather—You can *live* on the water if you like.

Inside the watertight interior, closed in by spray and side curtains, you can let the wind blow up a hurricane and laugh at it.

Warm and dry and cosy — the Kenyon Top to protect you from the elements above — you can scorn the danger of capsizing, if your boat seats are provided with

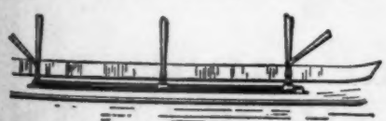
KENYON LIFE PRESERVER CUSHIONS

They always assure positive safety. Made in a host of different colors and kinds, and guaranteed to fit your boat seats perfectly.

Kenyon Pillows are necessary for comfort, and are always lying around in a handy place to save the man overboard.

A NEW CATALOGUE with descriptions of the whole line of Kenyon equipment is yours for the asking. ASK NOW. HERE IS A COUPON FOR YOUR CONVENIENCE.

The NEW JIFFY TOP



The Kenyon JIFFY Top is a brand new creation. It costs a little more than our Standard or Heavy Duty, but it will serve you well, especially on a river with numerous bridges to go under.

It can be easily put up or taken down by one or two persons, and will give excellent service for a life time.

Ask for our description in full.

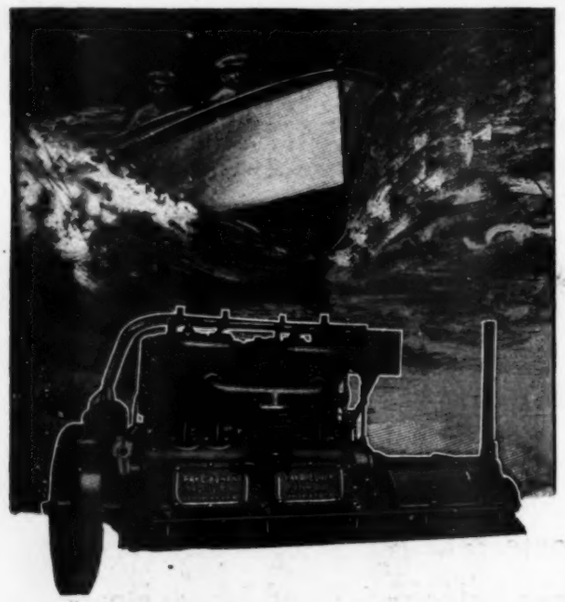
THE R. L. KENYON COMPANY
363 Meadow Street
Waukesha, Wis.

The R. L. KENYON COMPANY
363 Meadow Street
Waukesha, Wisconsin

Please send me your new catalogue describing the entire line of Kenyon Motor Boat Equipment.

Name _____

Address _____



It's the Power Plant

that finally makes the motor boat. The "go" has been put into many a slow boat by the unexcelled

FAY & BOWEN
Perfect Power Plant

Fay & Bowen system of triple lubrication for crank pins is unique. All gearing is completely enclosed, yet easy of access. No engine is quieter, simpler or more easy to handle. Bosch Dual Magneto ignition reduces high tension wiring and requires only one set of plugs, yet provides two ignition systems. Long stroke; intake and exhaust valves mechanically operated; both mechanical and splash lubrication; multiple plate reversing clutch.

Fay & Bowen four-cycle engines are made in a full line of cylinder sizes—put up in two, four and six cylinders—from 5 to 65 H. P.

If it's the *two-cycle* type you prefer, remember that Fay & Bowen two-cycle engines are the best. Single, double, and triple cylinder construction; 2½ to 45 H.P. Our two-cycle "Convertible" engines will really run on kerosene!

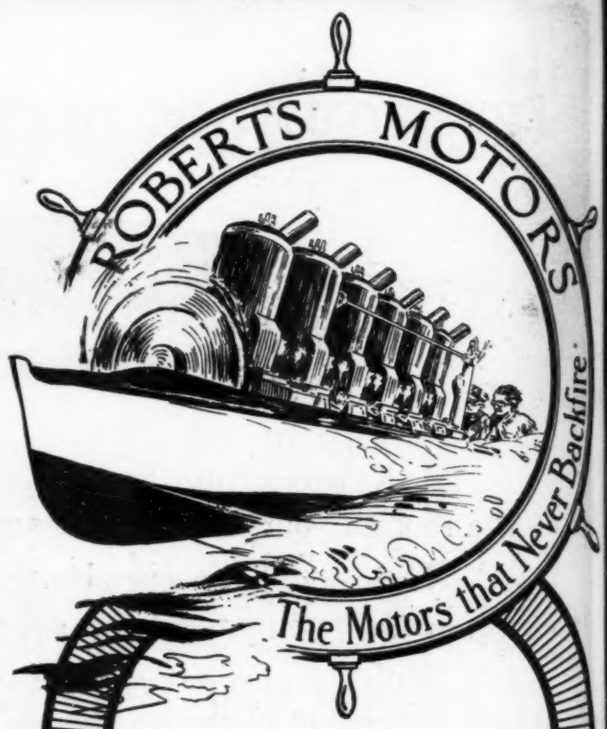
Fay & Bowen Boats include a line of different sizes and types from a 21 ft. family launch to our 32 ft. 20-mile "runabout," or a completely equipped cruiser. Our "25 ft. Special" family launch is a familiar sight on Long Island Sound, Lake Hopatcong, the Adirondack Lakes—wherever boat-lovers gather.

Send for Catalog and Prices

If you know what you want, tell us.
If you don't quite know, ask us.

F & B 2-cycle engine

FAY & BOWEN ENGINE CO.
104 Lake St., Geneva, N.Y., U.S.A.



ROBERTS MOTORS are built in ten sizes, 3 to 125 H.P., 1 to 6 Cylinders, in Standard, Aerolite and Featherweight types.

Thus, there is a Roberts Motor for any kind of a boat from the tiny hydroplane or power canoe to the International racer or large work boat.

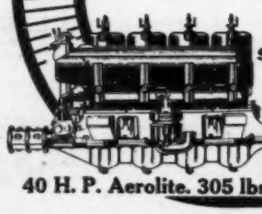
We can show you where a Roberts has already given the best of service installed in a boat similar to yours.

All Roberts Motors will operate equally well on kerosene or gasoline. This is of value to both buyer and agent. To buyer it means great economy of operation and to the dealer it suggests one of the strongest selling features of the 1913 season.

If you are not already familiar with these engines send for a catalog today. If they are known to you, you appreciate their value as a sales proposition, and it is suggested that you write for agency offer.

THE ROBERTS MOTOR CO.

1501 COLUMBUS AVE.
SANDUSKY, OHIO
U. S. A.



40 H. P. Aerolite. 305 lbs.

HARRY M. JONES, the Aviator, Wearing a "Neversink" Coat

IT IS TOO LATE FOR US TO HELP

The countless thousands who have been drowned, but the pity of it is that these drownings are still going on, that people are still risking their lives needlessly on the water, and this we ***can*** help and prevent, for to wearers of

THE NEVERSINK COAT

Drowning Is an Absolute Impossibility

and it is no trouble or inconvenience to wear the "Neversink" Coat. The coat is light and comfortable and is to all intents and purposes an ordinary coat.

It should be worn by every man, woman or child who ventures on the water

Members of your family will go upon the water this summer.
You should see to it that they at least are protected.

The "Neversink" Coat is made of khaki and lined with a special fibrous material as soft and pliable as down which has four times the bouyancy of cork.

NO CORK—NO INFLATION. THE COAT ITSELF KEEPS YOU AFLOAT

C. N. Mankowski, owner and helmsman of "Ankle Deep," wearing "Neversink" Waistcoat. 32 ounces.

TESTIMONIAL

WRIGHT & DITSON, 344 Washington Street,
Boston, Mass., July 11, 1912.

AMERICAN LIFE-SAVING GARMENT CO.,
57 State St., Boston, Mass.

Gentlemen:

I am writing to tell you that without a doubt your coat saved my life last Saturday when my boat sank off Marblehead, Mass., during a squall, and indirectly saved the fellows with me, as it enabled me to get their trousers and shoes off. We were in the water twenty minutes before help came, and I, personally, cannot keep above water ten minutes under the best conditions; so you see the coat came in very nicely. Under the circumstances, I feel that it is my duty to write you this letter.

Yours very truly,
IRVING C. WRIGHT.

W. Van Nostrand, helmsman of "Baby III," wearing old-style life-preserver. 7¼ lbs.

The Neversink Waistcoat

Possesses the same floating power as the coat and may be worn under an ordinary coat. If your dealer does not handle these garments, write us direct.

Write Today for Illustrated Booklet

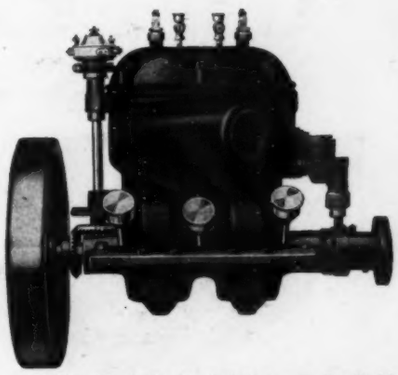
Our Guarantee—Satisfaction absolutely guaranteed or your money back.

AMERICAN LIFE SAVING GARMENT COMPANY

57 State Street, Boston, Mass.

The Matchless Eagle at a Matchless Price

This Is the Momentous Time of the Year



1913 High Speed Double Cylinder, 7-H. P. Model "2K," Bore 3¼—Stroke 3¼—Weight 136 lbs.

Completely Equipped with Excelsior float-feed marine carburetor, with option of Schebler carburetor, "Black Eagle" spark plugs, roller contact timer, bronze plunger pump with self-contained check valves, priming cup, grease cups, ball thrust bearings, flange coupling, "Eagle" water-cooled exhaust silencer, wrenches, screw driver, can of cylinder oil, can of grease, two oil cans, lag screws, and instruction book.

PRICE $95.00

16 other models to choose from

This is the time of year when every one interested in boating is planning for the season's pleasure. The demand for engines, supplies, and fittings will be urgent, and it will be important to supply this demand, and do it promptly. Of course, we are interested in the supplying of engines. Our line was never so complete as it is for the 1913 season. Our capital enables us to manufacture large quantities of engines during the winter months. We have "Eagle" engines for immediate shipment, just when you want them, and that in most cases, results in a sale. If you are a legitimate boat builder or dealer, our selling plans are such that you can purchase "Eagle" engines. We want you to feel free to come to us, even though you have never talked our product. "Eagle" engines are made so good and are sold at such attractive prices that a lucrative business is in store for you. There is a great advantage in associating yourself with a big, live institution, one competent to co-operate with you, one that can deliver the goods when wanted, one whose product has enjoyed for many years the confidence of the trade. Take a good look forward, think it over seriously, and let us get together.

THE STANDARD COMPANY, Torrington, Conn.

Our 1913 catalogue is worth writing for, and a request will bring it by return mail

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Know Your Engine Speed

The Hopkins Electric Tachometer

Indicates constantly the revolutions per minute of your engine shaft, thus enabling you to get the best results from your engine.

Accurate — Durable — Reliable

No flexible shaft to give trouble, the connection being an electric cable. Workmanship, material and accuracy guaranteed.

Write for Catalog

You realize the many advantages of knowing your exact engine speed, from which, after a few experiments, you can gauge fairly accurately the speed of your boat.

THE ELECTRIC TACHOMETER CO.

1344 Spring Garden Street : : Philadelphia, Pa.

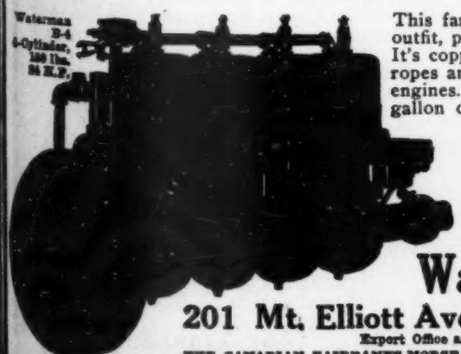
Full Speed Ahead—The Waterman Wins on the Water

Now—NOW—It's time you had a Waterman Motor in that new boat. Get a power plant that's worthy of her. You'll be proud of a Waterman, whether she's a cruiser or canoe. We have them for every purpose—for heavy, hard work in rough open sea—for speed contests—for pleasure and for business. No matter what your needs, a Waterman is GUARANTEED to meet them.

Here's 24 H.P. Developed Surely and Smoothly in 250 lbs.

The new 1913 model of the ever-dependable Waterman B-4, is a high-class four-cylinder engine with aluminum crank case, copper water jackets and all high-grade features. Pump and timer (and Bosch magneto if you desire) all driven by train of spur gears—not bevels. It's a cup winner in V-bottom boats and hydroplanes as well as in other types of speed and pleasure launches. Cylinders 4 x 4 in., developing 24 H.P. at 900 revolutions, and will run up to 1300. Weighs but 250 lbs. complete as shown. Our 1913 catalog tells all about this and others that have made the Waterman reputation.

The Powerful PORTO—Makes ANY Boat a Motor Boat in a Jiffy



This famous midget gives you TWO FULL H. P.—at 27½ lbs. per H. P. for the complete outfit, propeller, rudder and all. Has 2¾ in. bore, 3 in. stroke. It's copper jacketed, has under-water exhaust, steers with tiller ropes and is built with the same care as the largest Waterman engines. Drives an 18 ft. rowboat 7 miles per hour, 4 hours on a gallon of gasoline. The most power for the price; the most power for the weight. It's been making good for seven years, and so we are glad to sell it on trial. Latest model shown in full in new catalog.

FOUR BELLS—Full speed ahead if you are going to get that new catalog in ample time. Write for it today. We'll mail it at once, postpaid. A post-card will do, but mail it TODAY.

Waterman Marine Motor Co.

201 Mt. Elliott Avenue : : Detroit, Mich.

Export Office and Show Room, 47 Broadway, New York City.

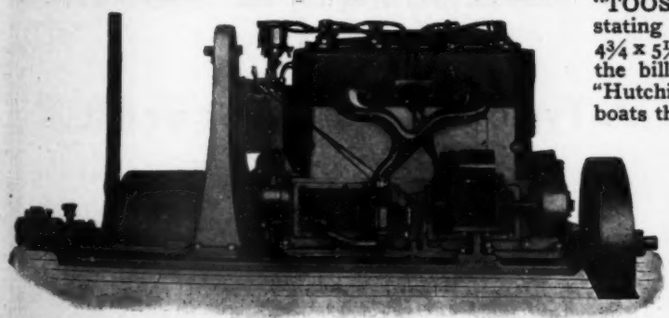
THE CANADIAN FAIRBANKS-MORSE CO., Ltd., Montreal, Quebec and Branches. Exclusive distributors for Canada of Outboard and Model K motors.

Always Used by Men Who Know

LOEW VICTOR MOTORS

YOU ARE going to notice right through this season that every time some recognized motor boating expert writes of his exceptional performances or his future plans, his power plant is always the Loew Victor. Watch this, and follow the men that lead.

Take, for instance, the recent article by Richard Hutchinson in POWER BOATING about his new 35-ft. cruiser "TOOSOON." You undoubtedly saw the editorial note stating that Mr. Hutchinson bought a six-cylinder 4¾ x 5½-in. Loew Victor, "which he figures will fill the bill." And as POWER BOATING says further, "Hutchinson has forgotten more about small motor boats than 99 per cent. of us will ever know.'



The same with Geo. P. P. Bonnell. His two articles describing his famous trip to Nova Scotia and the building of "Old Glory II" are yours now in book form if you like. You'll learn a lot about Loew Victor reliability by reading it.

Loew Victor Motor Model 5

A YEAR AHEAD

Four and six cylinder Loew Victor Motors for 1913 are equipped with a Leece-Neville Electric Self-Starting and Lighting Outfit which not only starts the motor cold, but furnishes ample and undiminished current for running lights, cabin lights and search-light. Does away with complicated lighting plants in present use. Operates automatically without attention —and always works.

LOEW VICTOR MOTORS FOR 1913

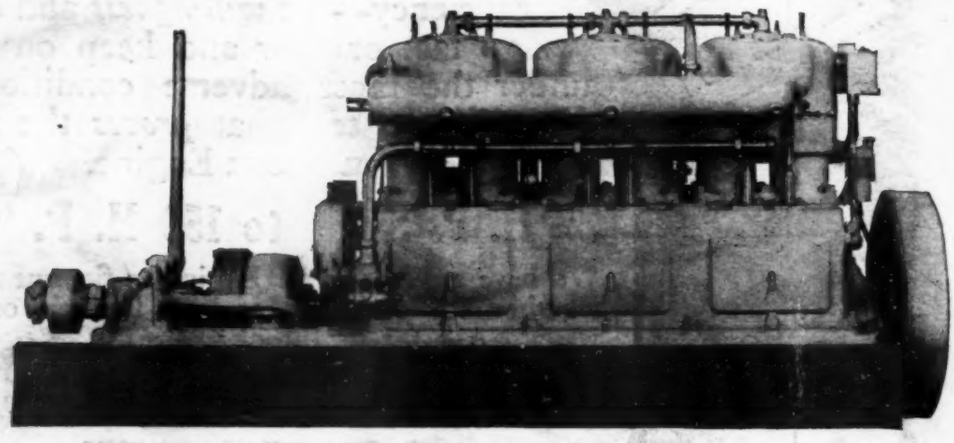
Medium Duty		High Speed	
1-Cyl.	6 H.P.	4-Cyl.	30 H.P.
2 "	12 "	4 "	40 "
3 "	18 "	6 "	60 "
4 "	25 "		
6 "	36 "		

The Loew Manufacturing Co. 1907 Madison Ave. Cleveland, Ohio

Sterling

THE ENGINE of REFINEMENT

For the finest boats that float



70-90 H.P. HEAVY DUTY 6½" x 9"

THE NEW STERLINGS

HEAVY Duty 70-90 H. P.—Six Cylinders—Bore 6 1-2 Inches—Stroke 9 Inches. The Most Flexible Heavy Duty Engine Built. 350 to 600 R. P. M.

350 R.P.M.	60 H.P.	500 R.P.M.	90 H.P.
400 "	70 H.P.	550 "	95 H.P.
450 "	80 H.P.	600 "	100 H.P.

Weight ..... 3400 pounds

THE Four Cylinder 45-60 H. P. Heavy Duty Engine Is of the Same Type, with the Same Bore and Stroke and the Same Flexibility.

350 R.P.M.	40 H.P.	450 R.P.M.	53 H.P.
400 "	45 H.P.	500 "	60 H.P.

Weight ..... 2575 pounds

OTHER new STERLINGS are the 20-35 H. P. Medium Duty and Speed Engine. Four Cylinders—Bore 4 3-8 Inches—Stroke 5 1-2 Inches.

THE 30-50 H. P. Medium Duty and Speed Engine. Four Cylinders—Bore 5 1-2 Inches—Stroke 6 Inches.

LET us give you complete specifications of these new engines. You've never seen anything like them before. They're years ahead of their time. The six cylinder engines are equipped with either air or electric self starter;—The four cylinder engines with electric starter if desired. Also electric lighting system.

The STERLING catalog sent free on request.

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